

Indian Journal of Gerontology

a quarterly journal devoted to research on ageing

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INDIAN JOURNAL OF GERONTOLOGY

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Evolution of Short-lived and Long-lived Races of *Drosophila* in the Environs of Laboratory

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ABSTRACT

Aging is no more an intractable process and it can be better understood by life span studies and interventions like dietary restriction in model organisms. The aim of this study was to determine the stability of lifespan in the laboratory evolved cytoraces of nasuta-albomicans complex of Drosophila. These cytoraces were subjected for the following lifespan assessments: a) three independent replicate assessments with standard food media; b) validation of short-lived and long-lived cytoraces by crossing experiments; and c) response of lifespan to dietary restriction with diluted yeast in the food media. The findings were: 1) establishment of cytoraces 3 and 15 as short-lived and cytoraces 2, 9, 11 and 16 as long-lived by three replicate lifespan assessments; 2) nonsignificant differences in lifespan of F1 offspring of short-lived as well as two long-lived crosses from their parents; 3) extension of lifespan in short-lived races, but not in long-lived races in response to dietary restriction. Thus, the evolution of new short-lived and long-lived cytoraces and their differential response to dietary restrictions could be due to rapid genomic changes that had taken place during introgression via hybridization.

Keywords : Cytoraces, Dietary restriction, Hybridization, Introgression, Nasuta-albomicans complex.

Lifespan and its influencing factors like humidity (Pearl and Parker, 1922), light density (Northrop, 1925), population density (Pearl *et al.*, 1927), nutrition (David and Fouillet, 1971) ultraviolet and ionizing radiation

(Gartner, 1973), temperature (Parsons, 1977) and larval crowding (Luckinbill and Clare, 1985) have been widely studied in *Drosophila melanogaster*. Differences in lifespan have been reported for both inter- and intra-specific variations among the *D. melanogaster*, *obscura* and *virilis* species groups (Durbin and Yoon, 1986, 1987). Since 1990's genetic screening efforts with invertebrates have unraveled multiple genetic pathways that suggest longevity is promoted through the manipulation of diet metabolism and the resistance to oxidative stress to those based on the pro-senescence role of genes important for fitness early in life (Charlesworth, 1993; Chippindale *et al.*, 1993; Chapman and Partridge, 1996; Sohal and Weindruch, 1996; Parkes *et al.*, 1998; Rogina *et al.*, 2000; Tatar *et al.*, 2003; Partridge and Gems, 2006; Paaby and Schmidt, 2009). Among all these interventions, dietary restriction is a potent regimen in extending lifespan in *Drosophila melanogaster* and it can be achieved by diluting yeast, the major source of protein, vitamins, lipids and cholesterol in adult nutrient media (Chippindale *et al.*, 1993; Chapman and Partridge, 1996).

To study aging and its interventions through dietary restriction, nasuta-albomicans complex (NAC) of *Drosophila* offers a unique opportunity, since they are the hybrid recombination products. The evolution of this complex of *Drosophila* took place in the environs of laboratory through interracial hybridization between *D.n.nasuta* and *D.n.albomicans* which are morphologically identical, cross fertile karyotypically dissimilar ($D.n.nasuta\ 2n=8: ?=2^n2^n\ X^n\ Y^n\ 3^n\ 3^n\ 4^n\ 4^n$; $?=2^n2^n\ X^n\ X^n\ 3^n\ 3^n\ 4^n\ 4^n$; *D.n.albomicans* $2n=6: ?=2^a2^a\ X^a\ Y^a\ 4^a\ 4^a$; $?=2^a2^a\ X^a\ X^a\ 4^a\ 4^a$, where 'n' and 'a' represents *D.n.nasuta* and *D.n.albomicans* chromosomes, respectively) immigrants species of nasuta subgroup of *Drosophila*. The hybrid products showed karyotypic mosaicism, but after F_{20} – F_{50} generations it was declined and karyotypically stabilized four hybrid cytoraces 1, 2, 3 and 4 were evolved (Ramachandra and Ranganath, 1986, 1990). Further, interracial hybridization was made among the newly evolved four cytoraces, *D.n.nasuta* and *D.n.albomicans*, which resulted in the formation of twelve new cytoraces 5 to 16; all these members were then together termed as *nasuta-albomicans* complex (NAC) of *Drosophila*

(Ramachandra and Ranganath, 1996). Based on the karyotypic homology, sixteen cytoraces were grouped under six types (Tanuja *et al.*, 2003) namely, Type 1 ($M : 2n = 7 - 2^n 2^a X3^a Y^n 3^n 4^n 4^n$; $F : 2n = 6 - 2^n 2^a X3^a X3^a 4^n 4^n$), Type 2 ($M : 2n = 6 - 2^n 2^a X3^a Y3^a 4^a 4^a$; $F = 2n = 6 - 2^n 2^a X3^a X3^a 4^a 4^a$), Type 3 ($M = 2n = 8 - 2^n 2^a X^n Y^n 3^n 3^n 4^a 4^a$; $F = 2n = 8 - 2^n 2^a X^n X^n 3^n 3^n 4^a 4^a$), Type 4 ($M = 2n = 7 - 2^n 2^a Y3^a X^n 3^n 4^a 4^a$; $F = 2n = 8 - 2^n 2^a X^n X^n 3^n 3^n 4^a 4^a$), Type 5 ($M=2n = 7 - 2^n 2^a X3^a Y^n 3^n 4^a 4^a$; $F = 2n = 6 - 2^n 2^a X3^a X3^a 4^a 4^a$) and Type 6 ($M = 2n = 7 - 2^n 2^a Y3^a X^n 3^n 4^n 4^n$; $F = 2n = 8 - 2^n 2^a X^n X^n 3^n 3^n 4^n 4^n$). During the evolution of these karyotypes some of the parental chromosomes eliminated and some of them were retained.

Introgressive hybridization is more common in plants, and appears rarer in animals than plants at approximately 10% of species in major faunal groups (Mallet, 2007). To evolve this kind of cytoraces in nature it would have taken 1000s of years, whereas, here in the environs of laboratory it has taken only a decade. Therefore, lifespan study in these unique cytoraces is interesting as they are the hybridization products with introgressed genomes. The purpose of this study was to determine lifespan and its survivorship in all the members of NAC of *Drosophila*. Interracial differences, differences with their respective parents and the response to dietary restriction were studied. The result of this study will contribute to the knowledge of evolutionary theory of aging in *Drosophila*.

Materials and Methods

The following stocks were used in the present investigations:

- Drosophila nasuta nasuta* (N) (Coorg, India)
- Drosophila nasuta albomicans* (A) (Okinawa strain, Texas collection, USA, 3045.11)
- Cytoraces 1 to 16 (Ramachandra and Ranganath, 1986, 1996)

Lifespan assessment

Stocks were maintained in half-pint bottles on standard molasses-agar-cornmeal medium supplemented by yeast at 22°C. For the regular lifespan assessment, all the above mentioned stocks were maintained in five replicate bottles. Flies in the culture bottles were allowed to

mate and lay eggs for around seven days and flies were removed. Then bottles with fertilized eggs were used to collect virgin flies after 20 days. Lifespan assessment was carried in three replicates using a modified protocol of Luckinbill and Clare (1985). For each of the replicate assessment, thirty unmated males and virgin females were collected and maintained separately in the vials with standard food medium supplemented with yeast (15mg per vial). Every alternate day, each male and female fly were transferred to fresh vial, mortality was recorded daily, likewise, a series of changes were made until all flies died.

Lifespan validation experiment

To understand the stability in lifespan of short-lived and long-lived cytoraces, we carried out four crosses (A, B, C, D). Each crosses experiment was carried with five pairs of unmated males and virgin females. Cross A - cytorace 3 males and cytorace 15 females; Cross B - cytorace 15 males and cytorace 3 females; Cross C - cytorace 2 males and cytorace 9 females; Cross D - cytorace 9 males and cytorace 2 females. Each pair was allowed to mate for seven days. Flies were then removed and vials of fertilized eggs were kept at 22°C until the F1 generation began to emerge. Thirty unmated males and virgin females from each cross were collected separately and maintained in the vials with standard food medium supplemented with yeast (15mg per vial). Every alternate day each male and female fly were transferred to fresh vial, mortality was recorded daily, likewise, a series of changes were made until all flies died.

Dietary restriction (DR)

DR was made by the dilution of yeast the major food constituent in the food medium of *Drosophila*. In the standard diet, 15mg of yeast was provided in each media vial and it is been reduced to 2mg in DR. Concentration of yeast was reduced by employing the method of Mair *et al.* (2005) with slight modifications.

For this experiment, the assessment of lifespan remains same as standard diet (with 15 mg of yeast per vial) experiment except the concentration of yeast provided in each vial.

Statistical Analysis

Lifespan analyses were performed using SPSS Version 10.0. Data for lifespan assessment was subjected to One-Way ANOVA with races being treated as the fixed factor. Kaplan Meier analysis is used to compare the survival of two or more groups and log-rank test is used to compare the survival distribution; and the survival curves show time or age on X-axis and the portion of all individuals surviving on Y-axis. Kaplan Meier survival analysis and log-rank test was conducted by using MedCalc software (version 10.4.3; <http://www.medcalc.be>).

Survivorship (l_x) was also measured, which is a measure of the proportion of individuals which survive to the beginning of age category x , and it was estimated as $l_x = n_x / n_0$, where n_x is the number of individuals in the study population which survive to the beginning of age category x , and $n_0 = N$ (the total population size). (<http://mathworld.wolfram.com/LifeExpectancy.html>).

Results

Lifespan assessment in three replicates

Lifespan assessment in all the members of NAC of *Drosophila* revealed differences in the mean lifespan ranging from 46.87 days to 99.04 days in males and 52.45 and 119.48 days in females. One-Way ANOVA of lifespan among the unmated males ($df=17$, $F=181.744$, $P < 0.001$) as well as virgin females ($df=17$, $F=207.308$, $P < 0.001$) of all the members of NAC of *Drosophila* indicated significant differences. Virgin females showed significantly longer lifespan than the unmated males ($df=17$, $F=129.794$, $P < 0.001$) in all the members of NAC of *Drosophila*. Log-rank test indicated nonsignificant differences among three replicates for lifespan in all the members of NAC of *Drosophila* (Table 1). Among all the cytoraces of NAC of *Drosophila*, both unmated males and virgin females of cytoraces 3 and 15 lived shorter and cytoraces 2, 9, 11 and 16 lived longer than any other cytoraces.

Table 1: Summary of the log-rank test conducted for the lifespan in three replicates in all the members of *nasuta-albomicans* complex of *Drosophila*. Thirty unmated males and virgin females were assessed for their lifespan in each replicate.

Races	Log-rank test among three replicates (in males)		Log-rank test among replicates (in females)	
	χ^2	P-value	χ^2	P-value
<i>D. n. nasuta</i>	0.0038	0.99	3.3563	0.19
<i>D. n. albomicans</i>	4.1892	0.12	1.2878	0.52
Cytorace-1	0.4983	0.78	0.1312	0.94
Cytorace-2	4.9356	0.08	2.6734	0.26
Cytorace-3	0.1547	0.92	2.7813	0.25
Cytorace-4	0.0324	0.98	0.1367	0.93
Cytorace-5	0.7716	0.68	1.9336	0.38
Cytorace-6	3.3475	0.19	1.1845	0.55
Cytorace-7	2.2420	0.33	1.1943	0.55
Cytorace-8	2.6657	0.26	0.7729	0.68
Cytorace-9	1.7750	0.41	0.2012	0.90
Cytorace-10	0.6872	0.71	0.3968	0.82
Cytorace-11	3.3754	0.19	4.7481	0.09
Cytorace-12	3.5555	0.17	1.6341	0.44
Cytorace-13	0.5085	0.77	1.6344	0.44
Cytorace-14	0.5491	0.76	1.0113	0.60
Cytorace-15	0.4044	0.82	0.6657	0.72
Cytorace-16	3.1525	0.21	0.4548	0.80

Comparison of lifespan by One-Way ANOVA in all the cytoraces with their respective parents revealed the following (Table 2): Both males and females of cytoraces 1, 2, 4, 8, 9, 10, 16, and only males of cytoraces 6, 12, 13, 15 and females of cytoraces 5, 11, and 14 showed greater lifespan than their parents, hence these were considered as positively transgressive. Females of cytoraces 3, 6, 12, 13 and 15; males of cytorace 11; as well as, both males and females of cytorace 7 were negatively transgressive for lifespan than their parents. Males of cytoraces 3, 5, and 14 were parental-like, since they did not show any significant differences in lifespan.

Table 2: Mean values $\pm$ SE of lifespan assessed in all the members of *nasuta-albomicans* complex of *Drosophila* along with One-Way ANOVA. Positive or negative transgressive indicates significantly longer or shorter lifespan of the cytoraces than their parents respectively, and if the value do not differs significantly from the parents then referred as parental-like. This classification is according to Schwarzbach *et al.*, (2001).

Mean Longevity of				One-Way ANOVA		
Cytoraces		Parents of Cytoraces		F-value	P-value	Transgressiveness
C1	M	73.19 $\pm$ 1.14	NM	47.65 $\pm$ 1.06	269.56	0.001 +ve transgressive
	F	96.57 $\pm$ 1.50	AF	59.62 $\pm$ 0.38	573.86	0.001 +ve transgressive
C2	M	90.72 $\pm$ 0.63	AM	50.52 $\pm$ 0.60	2170.25	0.001 +ve transgressive
	F	114.91 $\pm$ 0.68	NF	54.64 $\pm$ 0.77	3419.51	0.001 +ve transgressive
C3	M	46.87 $\pm$ 0.96	NM	47.65 $\pm$ 1.06	0.30	0.582 parent like
	F	52.45 $\pm$ 0.58	AF	59.62 $\pm$ 0.38	104.80	0.001 -ve transgressive
C4	M	67.45 $\pm$ 0.61	AM	50.52 $\pm$ 0.60	399.52	0.001 +ve transgressive
	F	87.54 $\pm$ 0.97	NF	54.64 $\pm$ 0.77	698.58	0.001 +ve transgressive
C5	M	74.80 $\pm$ 0.87	C1M	73.19 $\pm$ 1.14	1.27	0.262 parent like
	F	87.97 $\pm$ 0.66	AF	59.62 $\pm$ 0.38	1379.76	0.001 +ve transgressive
C6	M	74.19 $\pm$ 0.75	C4M	67.45 $\pm$ 0.61	48.88	0.001 +ve transgressive
	F	86.74 $\pm$ 0.80	C1F	96.57 $\pm$ 1.50	33.68	0.015 -ve transgressive
C7	M	62.24 $\pm$ 0.55	C1M	73.19 $\pm$ 1.14	74.83	0.001 -ve transgressive
	F	78.10 $\pm$ 0.81	C2F	114.91 $\pm$ 0.68	1209.85	0.001 -ve transgressive
C8	M	87.41 $\pm$ 0.60	C1M	73.19 $\pm$ 1.14	121.97	0.001 +ve transgressive
	F	100.34 $\pm$ 0.79	C4F	87.54 $\pm$ 0.97	103.43	0.001 +ve transgressive
C9	M	99.04 $\pm$ 0.61	C2M	90.72 $\pm$ 0.63	90.12	0.001 +ve transgressive
	F	119.48 $\pm$ 0.97	NF	54.64 $\pm$ 0.77	2717.19	0.001 +ve transgressive
C10	M	55.14 $\pm$ 0.57	C3M	46.87 $\pm$ 0.96	54.519	0.001 +ve transgressive
	F	67.40 $\pm$ 0.85	NF	54.64 $\pm$ 0.77	122.30	0.001 +ve transgressive
C11	M	88.72 $\pm$ 0.52	C2M	90.72 $\pm$ 0.63	5.97	0.016 -ve transgressive
	F	103.80 $\pm$ 0.76	AF	59.62 $\pm$ 0.38	2662.48	0.001 +ve transgressive
C12	M	58.24 $\pm$ 0.38	AM	50.52 $\pm$ 0.60	119.74	0.001 +ve transgressive
	F	69.62 $\pm$ 0.51	C1F	96.57 $\pm$ 1.50	291.74	0.001 -ve transgressive
C13	M	53.42 $\pm$ 0.70	AM	50.52 $\pm$ 0.60	9.91	0.002 +ve transgressive
	F	60.75 $\pm$ 0.69	C2F	114.91 $\pm$ 0.68	3091.90	0.001 -ve transgressive
C14	M	68.97 $\pm$ 0.88	C4M	67.45 $\pm$ 0.61	1.99	0.159 parent like
	F	85.96 $\pm$ 0.74	C3F	52.45 $\pm$ 0.58	1266.71	0.001 +ve transgressive
C15	M	49.52 $\pm$ 0.44	C3M	46.87 $\pm$ 0.96	6.26	0.013 +ve transgressive
	F	52.95 $\pm$ 0.54	C4F	87.54 $\pm$ 0.97	964.08	0.001 -ve transgressive
C16	M	90.24 $\pm$ 0.59	NM	47.65 $\pm$ 1.06	1245.28	0.001 +ve transgressive
	F	107.15 $\pm$ 0.61	C3F	52.45 $\pm$ 0.58	4189.87	0.001 +ve transgressive

M = Male; F = Female

The survivorship of all the members of NAC of *Drosophila* was plotted against age in days in Figure 1a-b. The dotted lines indicate reduced survival, whereas, plain lines indicate the highest survival in the members of NAC of *Drosophila*. Females showed higher survival than males in all the members of NAC of *Drosophila*. In both males and females of *D.n.nasuta*, *D.n.albomicans*, cytoraces 3, 7, 10, 12, 13 and 15 survivability reduced as compared to cytoraces 1, 2, 4, 5, 6, 8, 9, 11, 14 and 16, in which it got extended.

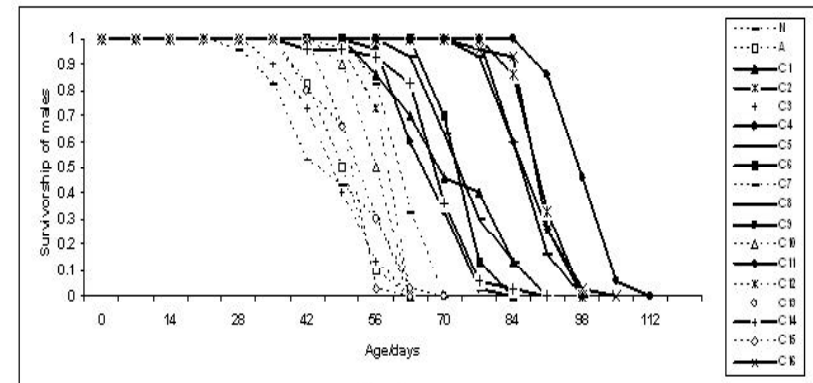


Fig. 1a

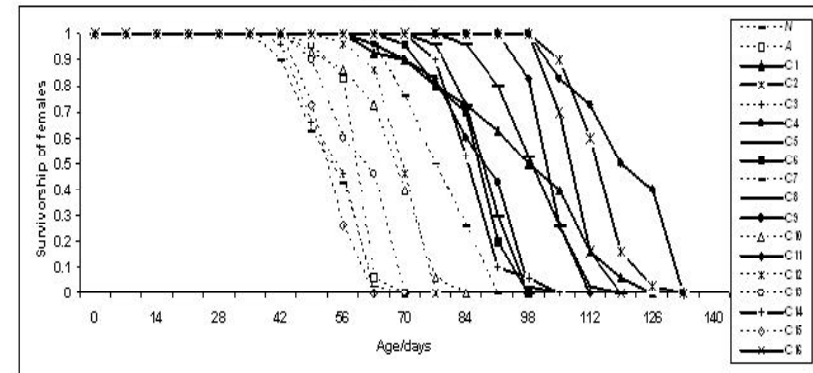


Fig. 1b

Figure 1a-b: Survivorship (lx) analysis of lifespan of males (a) and females (b) of all the members of *nasuta-albomicans* complex of *Drosophila*. Dotted lines (—) denote survival curve of cytoraces with reduced survival; plain lines denote the lifespan of cytoraces with higher survival.

Validation of short-lived and long-lived cytoraces

In order to further confirm the stability of lifespan in both short-lived and long-lived cytoraces, crosses were conducted between short-lived cytoraces (CROSS A: cytorace 3 male x cytorace 15 female; CROSS B: cytorace 15 male x cytorace 3 female) and between long-lived cytoraces (CROSS C: cytorace 2 male x cytorace 9 female; CROSS D: cytorace 9 male x cytorace 2 female). Lifespan of F1 offspring of these crosses were recorded and comparison was made between their respective parents by log-rank test (Table 3) which showed nonsignificant differences. Kaplan Meier survival curve was also plotted (Fig. 2a-d) to record the distribution of survival against age in days. In all the offspring of the four crosses and their parents there were nonsignificant differences in their survivorship.

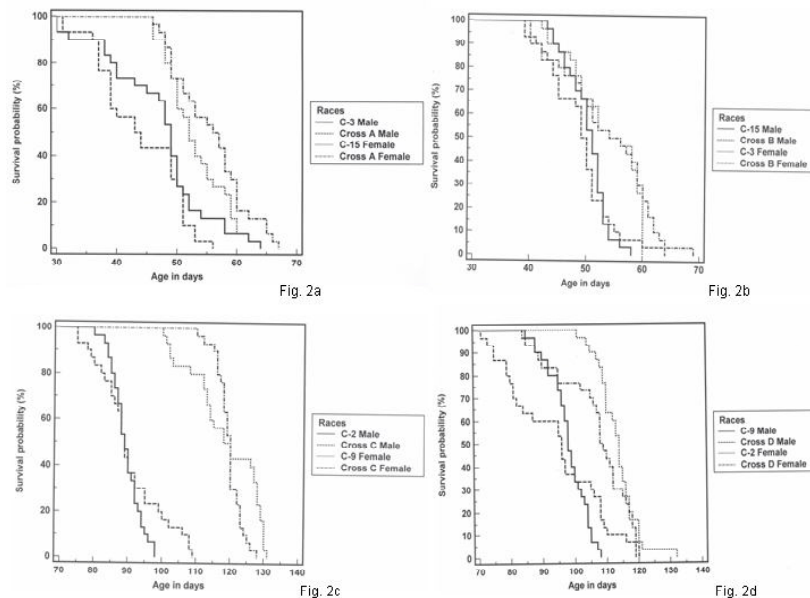


Figure 2a-d : Kaplan Meier survivorship curve of F1 offsprings of crosses with their respective parents: Figure 2a : Males and females of F1 offsprings of cross A with their male parent - cytorace 3 and female parent - cytorace 15; Figure 2b: Males and females of F1 offsprings of cross B with their male parent - cytorace 15 and female parent - cytorace 3; Figure 2c: Males and females of F1 offsprings of cross C with their male parent - cytorace 2 and female parent - cytorace 9; Figure 2d: Males and females of F1 offsprings of cross D with their male parent - cytorace 9 and female parent - cytorace 2.

Table 3: Comparative analysis of lifespan between offspring of crosses A, B, C and D and their respective parent using log-rank test. Thirty flies assessed separately for each cross.

Crosses	Parents	F1 offspring	Log-rank test	
			χ^2	P-value
Cross A	C-3M × C-15F	M	2.37	0.12
		F	3.60	0.06
Cross B	C-15M × C-3F	M	0.14	0.71
		F	1.05	0.30
Cross C	C-2M × C-9F	M	1.65	0.20
		F	3.35	0.07
Cross D	C-9M × C-2F	M	0.61	0.43
		F	3.08	0.08

One-way ANOVA among the F1 offspring of all the crosses (A, B, C and D) showed significant differences (? : df=3, MS- 21237.656, F-value- 220.643, P=0.001 and ? : df=3, MS-35125.044, F-value- 584.717, P= 0.001).

Influence of DR on short-lived and long-lived cytoraces

All the members of NAC of *Drosophila* were further subjected to DR in order to understand its effect on lifespan. The mean lifespan in response to DR extended significantly in both males and females of all the members of NAC of *Drosophila* except the long-lived cytoraces 2, 9, 11 and 16 (Table 4). The extension of lifespan in response to DR was maximum in *D.n.nasuta*, *D.n.albomicans*, cytorace 3 and cytorace 15, than any other cytoraces. In respect to this, comparisons of survivorship between standard diet and restricted diet were plotted for *D.n.nasuta*, *D.n.albomicans* and two short-lived and four long-lived cytoraces (Fig.3a-d). The rate of survivorship increased remarkably in DR in all short-lived cytoraces as compared to standard diet, whereas no such differences were noted in the survivorship in all the four long-lived races.

Table 4: One-Way ANOVA of lifespan between standard diet and dietary restriction in both males and females of the members of *nasuta-albomicans* complex of *Drosophila* (df =1 and *= P<0.001).

Races	One-Way ANOVA			
	Males		Females	
	Mean Square	F-value	Mean Square	F-value
<i>D. n. nasuta</i>	63700.41	417.84*	38253.75	319.83*
<i>D. n. albomicans</i>	54180.15	506.78*	29437.35	249.29*
Cytorace-1	14106.67	90.78*	6489.60	29.95*
Cytorace-2	380.02	2.69	8.067	0.11
Cytorace-3	130480.07	257.01*	61376.02	181.85*
Cytorace-4	59220.42	760.50*	17922.82	198.05*
Cytorace-5	19983.75	93.97*	5453.07	125.03*
Cytorace-6	22854.02	1000.53*	7843.27	174.73*
Cytorace-7	43040.82	1331.51*	5606.67	138.78*
Cytorace-8	2208.27	21.96*	224.27	2.34*
Cytorace-9	52.27	0.83	72.60	0.99
Cytorace-10	10962.02	117.50*	9151.35	50.51*
Cytorace-11	114.82	3.42	6.02	0.55
Cytorace-12	29703.75	463.96*	8616.02	281.81*
Cytorace-13	66733.35	472.08*	29659.27	163.90*
Cytorace-14	6489.60	134.15*	2829.07	62.42*
Cytorace-15	85957.35	325.27*	68141.40	1327.60*
Cytorace-16	132.02	4.39	22.82	1.34

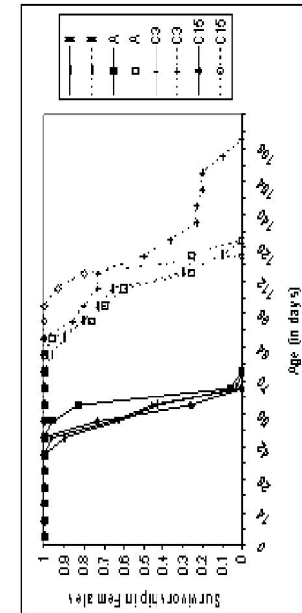


Fig. 3b

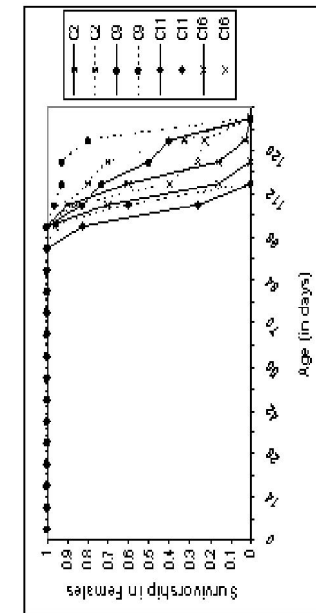


Fig. 3d

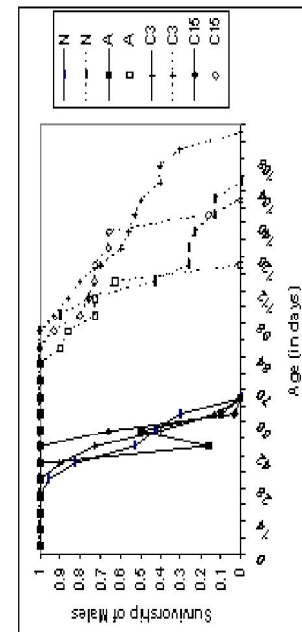


Fig. 3a

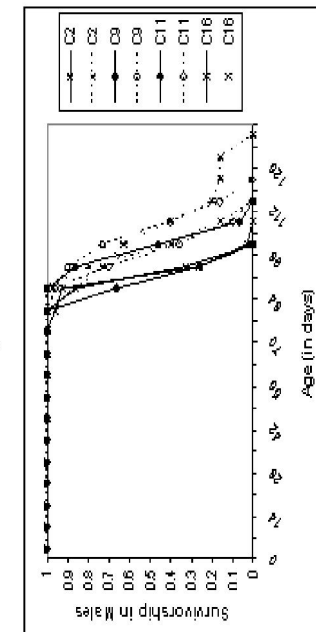


Fig. 3c

Figure 3a-d : Survivorship (1x) of standard lifespan and dietary restricted lifespan in males and females of *D.n.nasuta*, *D.n.albomicans* and two short-lived (Fig. 3a and 3b) and four long-lived cytoraces (Fig. 3c and 3d). Plain line denotes standard lifespan and dotted line (—) denotes dietary restricted lifespan.

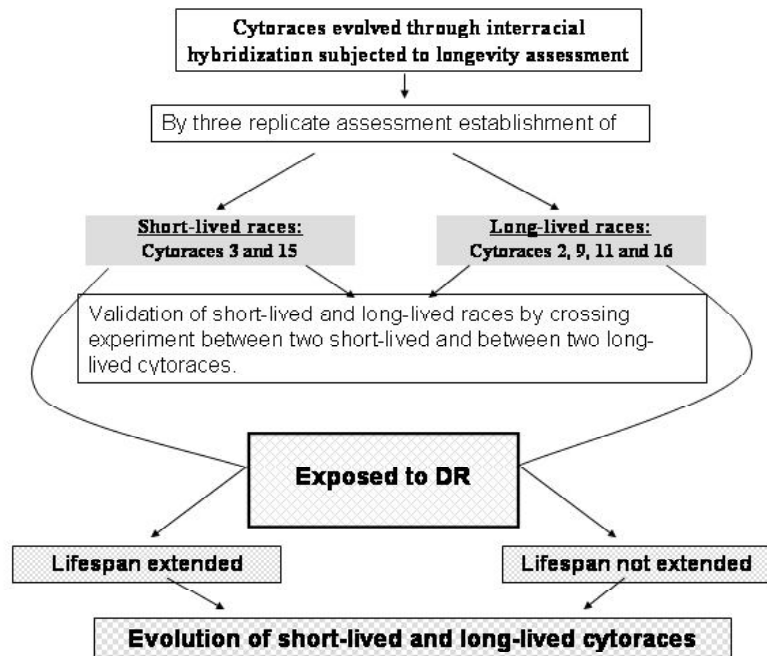


Fig. 4

Figure 4: Schematic representation of evolution of short-lived and long-lived cytoraces in *Drosophila* in the environs of laboratory.

Discussion

Evolutionary theories of aging and longevity are those theories that try to explain the remarkable differences in observed aging rates and longevity records across different biological species (Gavrilov and Gavrilova, 2002). The problem of the biological evolution of aging was initially studied in a purely theoretical, nonexperimental way. On the contrary, the evolutionary plasticity of aging and longevity is now an established experimental fact (Gavrilov and Gavrilova, 2002; Partridge and Gems, 2007). Determination of lifespan to assess the value of specific genetic alterations has important contribution (Rogina and Helfand, 2004). In the present study, the racial differences were observed with respect to lifespan in the members of NAC of *Drosophila*. Lifespan of cytoraces have been compared with their respective parents and categorized according to Schwarzbach et al., (2001) as positive or negative transgressive which indicates significantly greater or lesser

lifespan of hybrids than their parents, respectively, and if the value does not differ significantly from the parents, it is referred as parental-like. Such types of transgressiveness was recorded in our cytoraces, however, majority of the cytoraces are positively transgressive for lifespan than their parents.

Derivation of short-lived and long-lived cytoraces

Among all the cytoraces of NAC of *Drosophila*, cytoraces 3 and 15 showed shorter lifespan and cytoraces 2, 9, 11 and 16 showed longer lifespan than any other cytoraces. However, the remaining showed intermediate lifespan. These cytoraces have also shown differences in lifespan from their parents. In addition, these findings with the earlier assessment of Harini and Ramachandra (2003) have shown significant differences in the lifespan of cytoraces 1, 2, 9, 11 and 16. The pertinent question to be answered is : are the cytoraces stabilized for the longevity trait or still evolving? To address this question two additional lifespan assessments were carried out which revealed nonsignificant differences among cytoraces and derived two short-lived 3 and 15 as well as, four long-lived 2, 9, 11 and 16 cytoraces.

Another experiment was conducted to further validate the stability in the lifespan through crosses between two short-lived cytoraces i.e., cytoraces 3 and 15, as well as between two long-lived cytoraces 2 and 9. The reason behind this attempt was to know, whether the F1 offsprings of short-lived and long-lived races deviate from their parents? Interestingly, there is no heterosis, and no significant differences in the lifespan between F1 offspring of crosses and their respective parents; this strongly supported the stability of lifespan in cytoraces.

Influence of DR on lifespan

Dietary restriction is considered as a potent regimen that increases longevity in different organisms (Heilbronn and Ravussin, 2003; Kuobova and Guarente, 2003; Mair et al., 2005; Heydari et al., 2007). In the present study, the approach was to know whether DR has any influence on lifespan of cytoraces? Does DR enhance longevity in short-lived cytoraces? Does it disclose the secret behind living long? Can dietary restriction be considered as an important player in dictating the hidden secret of lifespan in our laboratory evolved hybrid races? We report racial divergence in the lifespan with response to DR. The

influence of DR on D.n.nasuta, D.n.albomicans, and two short-lived races cytoraces 3 and 15 is tremendous which has extended their lifespan significantly than the standard diet, whereas, unlike of other cytoraces, surprisingly, cytoraces 2, 9, 11 and 16 which have lived longer in the standard diet have not extended their lifespan further in response to DR. This indicates that cytoraces are unique introgressed products thereby exhibiting differential response to DR.

Since the short-lived and long-lived cytoraces have gathered different chromosomes from their parents it has an important input in determining lifespan. These cytoraces have not retained or eliminated all the chromosomes of D.n.nasuta or D.n.albomicans. When we compare the chromosome complements of cytoraces with their parents, the following observations can be made: 1) All these cytoraces are stabilized with heteromorphic second chromosomes indicating the balancing selection, by being retained with both the parental second chromosome; 2) All the short-lived and long-lived cytoraces possess D.n.albomicans dot chromosomes indicating the action of directional selection to retain only D.n.albomicans dot chromosomes; 3) Cytoraces 3, 15 and 16 exclusively retain third and X-chromosomes of D.n.nasuta, whereas, cytoraces 2, 9, 11 retained X3 and Y3 chromosomes of D.n.albomicans, here selection has favored both kinds of sex chromosomes indicating the mosaic selection. One of the possible explanations for this could be genomic stability in the cytoraces. During evolution, the favoured chromosomes have undergone unique kind of recombination and fixed the favorable new haplotype segments in short-lived and long-lived cytoraces from the parental species via hybridization and allowed the cytoraces to evolve differently with respect to the lifespan by being colonized with novel introgressed genomes (Fig. 4). Similarly, Baack and Rieseberg (2007) reported in plants the impact of hybridization on genomic stability; which can result in genomic changes including alterations to gene expression, chromosomal structure and genome size. Therefore, large magnitude of rapid genomic changes has caused differential lifespan and its response to DR. Hence, DR is considered to have played an important role in this study in substantiating the evolution of short-lived and long-lived cytoraces of NAC of *Drosophila*.

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Profile of Psychiatric and Physical Morbidity of Elderly Patients Attending Psychiatric Department in a General Hospital in India: Reflecting Service Needs

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ABSTRACT

Information on the psychiatric and physical morbidity of the elderly in developing countries is sparse. This study aimed to find out the profile of psychiatric and physical morbidities in the 450 consecutive elderly persons who attended psychiatric department for one year and followed up for two years in a medical college hospital in South India. Majority (94.2%) of elderly had diagnosable syndromal psychiatric disorder and 10.8% had psychiatric co-morbidity. Almost half (54.9%) had the onset of illness between 50-64 years of age. Mood disorders were common followed by anxiety disorders. Psychotic and organic mental disorders and substance use were also present in considerable proportions. Most of the patients (73.7%) had physical morbidity; in which hypertension, metabolic, cardiovascular and central nervous system disorders predominated. Results of this study reaffirm reports of higher physical morbidity in elderly psychiatric patients, suggest proactive evaluation for these and may help in developing specific services.

Key words : Elderly, Psychiatric diagnosis, Physical diagnosis, Co-morbidity, Developing country

As people survive longer into later years, the elderly population is increasing worldwide. Dependent on this the burden of physical and psychiatric morbidity is expected to be increasing too. There is little information about the profile of psychiatric morbidity in elderly of developing countries like India, where the population growth in this age group is highly noticeable. Life expectancy in India has risen considerably in recent years (source: National Commission on Population; Kumar, 2009) leading to gradual expansion of proportion of the elderly.

The information on associated physical comorbidity of the elderly psychiatric patients in developing countries is also sparse. It is known that there is higher morbidity for physical illness and disability in those who present with psychiatric disorder in late life (Satapathy *et al.*, 1997). The diagnostic and treatment procedures for these non-communicable diseases in elderly are costly; and as a result health care expenditure for the elderly will rise. Development of any old age psychiatric services would require the information on the nature and extent of these problems.

Despite this there is not much of recent literature available in India regarding the nature of psychiatric morbidity and physical comorbidities in the elderly. Few reports (Vekoba Rao *et al.*, 1972; Prasad *et al.*, 1996; Satapathy *et al.*, 1997; Shah, 1996) have discussed this issue to some extent; however large gaps in the knowledge base still exist. There is a strong need for further specific information on this subject not only for reflecting clinical need but also to focus on service development for this particularly needy age group.

The specific objectives of this study were to assess the profile of psychiatric morbidity in those aged 50 years and above attending psychiatric services in a medical college hospital and to study the type of associated physical illnesses. It was expected that the study will help to assess the clinical need of this age group to reflect on the service requirements.

Method

The study was conducted in the Kasturba Hospital, Manipal. Consecutive out-patients aged 50 years and above who attended one of the two units of Department of Psychiatry of Kasturba Medical

College, Manipal, on three specific days in a week for a period of one year were included in the study. The information on demographic variables, referring departments, present and past history, physical and psychiatric investigations and examinations, diagnoses, treatment and follow-up were noted from the case records of patients which includes information from all the outpatient attendances, in-patient stay if any of all the departments.

The existing psychiatric and physical conditions were studied. The data collection for information regarding attendance to other departments and additional diagnoses was continued for two years. Departments of the hospital use specific forms for history taking, recording of information and investigations. International Statistical Classification of Diseases and Related Health Problems (ICD-10) (WHO, 1992a) criteria are used for coding diagnoses in the hospital. Psychiatric diagnoses are confirmed by the consultant psychiatrists. Confidentiality of the information was assured by codifying all the identifiable data. This was considered as a non-interventional evaluation study.

Results

During the study period, record of 450 patients in this particular age group constituting of 236 males (52.4%) and 214 females (47.6%) were analyzed. The mean age of the patients was 58.9 years (range 58-89 years). Age and sex wise distribution of patients are given in table 1. About 77% (n: 347) patients were in the age group of 50-64 years while about 23% (n: 103) patients were 65 or more in age. There was no difference in distribution of different genders across the age groups considered.

Majority of the patients (75.1%) were referred from other departments (67.5% from medicinal departments and 7.5% from surgical departments). Of these 35% were referred from department of medicine, 18% from neurology and about 6% from cardiology. Referring surgical departments were commonly general surgery, otorhinolaryngology, ophthalmology, orthopaedics etc. About 25% of the patients came directly to psychiatry department.

Table 1 : Age and gender distribution of patients

Age Group	Male (n=236) N (%)	Female (n=214) N (%)	Total (n=450) N (%)
50-54	79 (33.5)	74 (34.6)	153 (34.0)
55-59	51 (21.6)	52 (24.3)	103 (22.9)
60-64	42 (17.8)	49 (22.9)	91 (20.2)
65-69	35 (14.8)	19 (8.9)	54 (12.0)
70-74	12 (5.1)	12 (5.6)	24 (5.4)
75 and above	17 (7.2)	8 (3.7)	25 (5.5)

Psychiatric morbidity: Out of 450 patients studied, 424 patients (94.2%) had at least one syndromal psychiatric disorder. Comorbidities were present in 10.8% of the patients with psychiatric disorders. Diagnostic breakup of major categories according to ICD-10 Classification of Mental and Behavioural Disorders (WHO, 1992b) is given in table 2. Mood disorders predominated followed by the neurotic disorders. Substance use disorders exclusively present in male population. Further diagnostic breakup up to fourth character according to ICD-10 was attempted for common psychiatric disorders (data was available for 383 diagnoses) (Table 3).

Table 2 : Diagnostic break-up of major categories according to ICD-10

ICD-10 categories	Psychiatric diagnoses	n	%*
F 00-09	Organic mental disorders	39	9.2
F 10-19	Psychoactive substance use disorder	37	8.7
F 20-29	Psychotic disorders	31	7.3
F 30-39	Mood disorders	243	57.3
F 40-48	Neurotic, stress related and somato form disorders	107	25.2
F 50-59	Behavioral syndromes associated with physiological disturbances and physical factors	9	2.1
F 60-69	Personality disorders	3	0.7
F 70-79	Mental retardation	1	0.2

* out of 424 patients who had psychiatric disorder

Table 3 : Further diagnostic break-up up to fourth character of ICD-10 codes

Psychiatric diagnoses	n	%*
Dementia	12	2.8
Organic mood disorder	20	4.7
Alcohol dependence syndrome	26	6.1
Schizophrenia	14	3.3
Delusional disorder	8	1.9
Bipolar affective disorder	41	9.7
Depressive episode	112	26.4
Recurrent depressive disorder	20	4.7
Dysthymia	67	15.8
Panic disorder	38	8.9
Somatoform disorder	33	7.8

*out of 424 patients who had psychiatric disorder

Age of onset of different psychiatric disorders are presented in table 4 (data was available for 391 patients). It was found out that 54.9% of the cases psychiatric disorder started during 50-64 years of age, while in around one third the onset was before 50.

Table 4: Age of onset of different psychiatric disorders

Psychiatric disorder	n	< 50 years n (%)	50-64 years n (%)	65+ years n (%)
Dementia	12	1 (8.0)	5 (42.0)	6 (50.0)
Organic mood disorder	20	2 (10.0)	14 (70.0)	4 (20.0)
Alcohol dependence syndrome	26	26 (100)	0 (0.0)	0 (0.0)
Schizophrenia	14	8 (57.0)	5 (35.0)	1 (7.3)
Delusional disorder	8	3 (37.5)	4 (50.0)	1 (12.5)
Bipolar affective disorder	41	28 (68.0)	13 (32.0)	0 (0.0)
Depressive episodes	112	7 (6.3)	83 (74.1)	22 (19.6)
Recurrent depressive disorder	20	15 (75.0)	5 (25.0)	0 (0.0)
Dysthymia	67	16 (23.9)	46 (68.7)	5 (7.5)
Panic disorder	38	13 (34.2)	22 (57.9)	3 (7.9)
Somatoform disorder	33	10 (30.0)	18 (55.0)	5 (15.0)
Total	391	129	215	47

Physical illness: Majority (n: 332, 73.7%) of patients were found to be suffering from at least one physical disease. The frequencies of physical diagnoses are shown in table 5. Most common associated physical illness was hypertension; 35.5% of patients suffered from this.

Table 5 : Physical diagnoses.

Physical diagnoses	n (%)*
Hypertension	118 (35.5)
Metabolic and endocrinal disorders(Diabetes mellitus, thyroid dysfunction and hyperlipidaemias)	95 (28.6)
Gastrointestinal disorder(Acid peptic disease, functional bowel disease and hepatitis)	80 (24.1)
Neurological disorder(Cerebrovascular disease, Parkinson's disease and vascular headache)	74 (22.3)
Respiratory disorder(Chronic obstructive pulmonary disease and pulmonary tuberculosis)	69 (20.8)
Cardiac disorder(Ischaemic and valvular heart diseases)	50 (15.1)
Hematological disorder(Anemia)	29 (8.7)
Genitourinary disorder(Renal failure, prostatomegaly and hernia)	28 (8.4)
Musculoskeletal disorder(Spondylosis and arthritis)	24 (7.2)
Sensory disorder(Cataract)	24 (7.2)
Neoplasia	20 (6.0)

Discussion

This study provides the profile of elderly patients attending psychiatric department in a tertiary level of hospital in a developing country. It provides information of the proportion of physical and psychiatric diagnoses in this population emphasizing the type and magnitude of burden. The results suggested that amongst patients attending psychiatric department around 94% had at least one diagnosable syndromal psychiatric disorder, with one in ten having psychiatric comorbidity.

Psychiatric morbidity

Mood disorders especially the depressive disorders predominated the psychiatric diagnoses. Major depressive disorders (depressive episodes and recurrent depressive disorders) were found to be most common with about 31.1% of the patients suffering from these. About 16% of the patients had dysthymia. Depression has been reported as most frequent disorder in elderly population (Tiple *et al.*, 2006; Ames, 1990). Persistent depression is a risk factor of suicide in elderly (Hepple and Quinton, 1997). Higher comorbidity of depressive disorders with physical illnesses have been reported (Draper and Anstey, 1996); and 'cause/effect' type of link has been described (Adamis and Ball, 2000). Anxiety disorders mostly panic and somatoform disorders were present in the studied population. Syndromes like sleep disorders, sexual dysfunctions were less commonly noted.

About 7% patient had psychotic disorders. Amongst them schizophrenia was found to be most common followed by delusional disorders where the persecutory type was found to be the most frequent. Management of psychotic disorders in elderly with comorbid physical disorders especially with metabolic disorders is expected to be fought with clinical hurdles.

Amongst the organic disorders mood disorders were most common followed by dementia. Proportion of patients with dementia was considerably more above the age of 65 as expected. There is a growing concern regarding this in the subcontinent as the population is fast ageing and age is a risk factor for dementia (Kar, 2005). It is expected that there will be an increase demand for specific services for dementia in India in coming years.

Substance abuse, especially alcohol dependence was present in around 6% which is considerable in comparison to reported figures else where (Ticehurst, 1990). It may be highlighted that alcohol dependence is associated with high physical morbidity and may lead to secondary psychiatric disorders. Unlike in other cultures where onset of alcohol abuse have been reported late in life (*ibid*), in the index study all the patients with alcohol dependence started it before 50.

Age at onset of psychiatric illness

More than half the patients had their onset of psychiatric illness between 50-64 years. Most common of these disorders were mood disorders e.g. depressive episodes, dysthymia, organic mood disorders. It was interesting to note that panic and somatoform disorders also started in this age group. In the psychotic disorders, delusional disorders predominated, however schizophrenia continued to be identified even in the late years. Dementia onset was more common in higher age as expected.

Physical co-morbidity

Importance of physical comorbidity in the elderly psychiatric patients can not be over emphasized. Physical morbidity in elderly psychiatric patients has been reported to be high in different set ups like day hospitals (Pryce *et al.*, 1983), residential homes (Ames, 1990) and psychiatric wards (Draper, 1994) and is considerable more than that in younger psychiatric patients (Abiodun, 2000). As observed in this study a great majority of patients (73.7%) had physical comorbidities which are comparable to reported figures (Adamis and Ball, 2000; Draper, 1994). Besides physical and psychological distress, many physical disorders may have an etiological role directly contributing to the psychiatric morbidity, overall disability and impacting quality of life (Kar and John, 2003). Comorbid physical illnesses are also known to independently predict the outcome of psychiatric morbidity (Koenig *et al.*, 2006). Similarly psychiatric disorders also influence outcome of physical disorders (Morris *et al.*, 1993). In addition, there are side effect and interaction issues related to medications for both physical and psychiatric disorders.

Most of the comorbid physical diagnoses were understandably had contributing role towards psychiatric morbidity or could be seen as factors that need to be considered for the medicinal management of psychiatric disorders. Hypertension, endocrine disorders, hyperlipidaemias, functional bowel disease, hepatitis, cerebrovascular disease, Parkinson's disease, ischaemic and valvular heart diseases were common. Most of these like hypertension, diabetes and cardiovascular illnesses have been reported more in elderly depressives than subjects with schizophrenic or organic disorders (Adamis and Ball,

2000). The reported proportions of affected systems may vary in different set-ups e.g. acute organic brain syndrome from septicaemia was most common in a study from Nigeria (Abiodun, 2000).

What may be highlighted is that most of the physical disorders may be missed without focused clinical endeavour (Adamis and Ball, 2000; Satapathy *et al.*, 1997). Screening for physical comorbidities should be a primary focus in elderly psychiatric patients. Collaborative work between other departments of medicine and psychiatry should also be encouraged as has been suggested (Abiodun, 2000). The results of this study suggest that geriatric psychiatric services should be well supported by services for general physical health. The high prevalence of physical morbidity has implications for training and continuing professional development of those in Old Age Psychiatry Services (Adamis and Ball, 2000; Shulman *et al.*, 1986). Higher comorbidities also translate higher costs of care, besides clinical complexities and individual distress. The issue is highly relevant in developing countries where individuals or their family pay for their treatment with no or meagre state support.

Limitations

No specific diagnostic screening protocols were followed to investigate. The diagnoses were based on the clinical evaluations and investigation depending upon the presenting complaints, as usually practiced in the clinics. There is still a possibility of missed diagnoses, if the symptoms were not adequately presented, assessed or investigated. So there is a chance of under-reporting. Uniform data were not available, and in some cases there were missing data.

Conclusion

Profile of elderly patients attending psychiatric department in a medical college hospital in a developing country suggested that a large majority had diagnosable syndromal psychiatric disorder and a sizeable proportion had psychiatric comorbidity. Mood disorders were common followed by anxiety disorders. Psychotic and organic mental disorders and substance use were also present in considerable proportions. Majority of patients had physical morbidity; in which hypertension, metabolic, cardiovascular and central nervous system disorder predominated. Proactive evaluation for physical comorbidities is

suggested considering their impact on psychiatric morbidity and management of elderly psychiatric patients. In addition, assessing health needs of elderly psychiatric patients is important first step in developing comprehensive services for them. Observations in this study are expected to be helpful in this regard.

Acknowledgement

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Missing Data in Cases of Dementia : An Analysis

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ABSTRACT

When handling missing data, a researcher should be aware of the mechanism underlying the missingness. In the presence of non-randomly missing data, a model of the missing data mechanism should be included in the analyses to prevent the analyses based on the data from becoming biased. Modeling the missing data mechanism, however, is a difficult task. One way in which knowledge about the missing data mechanism may be obtained is by collecting additional data from non-respondents. In this paper the method of re-approaching the data which was found missing is described. As the case files were accessible it could be retrieved and the patterns of missingness were discerned. The additional data resulted in a larger sample, probing for the causes of missingness resulted in more knowledge about the nature of the missing data patterns. Findings are discussed focused on the report of missing data and identification of missing data mechanism and finally recommendations are presented.

Key words : Missing data, Dementia, Missing completely at Random

Missing data are a part of almost all research. In such studies, it is important to decide how to deal with missing data from time to time. Missing data problems are common in health research (e.g. retrospective and prospective studies), sample surveys (e.g. non-response). When analyzing data, it is commonplace to observe that data are not always complete for each case. Rather, some data are

usually missing. Missing data is a problem that is ubiquitous to all clinical studies and a source of multiple problems from an analytic point of view such as reduced statistical power, increased the type I error, bias (Little & Rubin, 1987; Little & Rubin, 2002).

In some cases the amount of missing data may be minimal; in others it may be significant .There are many types of missing data and different reasons for data being missing. Both issues affect the analysis. Improper handling of missing values will distort analysis. Missing data are much more common in retrospective studies, in which routinely collected data are subsequently used for a different purpose (Burton & Altman 2004).

Researchers need to approach and handle missing data with caution following relevant principles and methods, but missing data are frequently deemed missing at random and simply discarded in practice. Such a naïve approach however can produce bias in the analysis result and therefore, special attention is required in treating missing data. In order to best approximate the missing values and represent the population without distortions researchers need to identify the patterns of missing data and the mechanisms that causes the data to be missing, which should determine the way in which data are treated.

The aim of the current paper was to determine the patterns of missing data which was created on Psychosocial and Clinical Characteristics of Patients Diagnosed with dementia and further also to determine the remedies for the same.

Material & Methods

The database was created on various psychiatric disorders from a teaching General Hospital attached to a medical college. Cases of Dementia were selected for this study. The Psychosocial and Clinical Characteristics of Patients Diagnosed with dementia according to I.C.D.-10 formed the sample for this study. The data was entered by a professional in health management. The data were entered in Excel worksheets which were scrutinized closely and the missing variables were noted. The causes for missingness of the data was assessed.

Results

In all there were seventy one cases diagnosed as Dementia. On the whole in 26 cases only some or the other variables were found missing and the rest were complete in most ways.

Table 1 : Distribution of Psychosocial Characteristics of Patients with Dementia

Variable	N-71	Variable	N-71
Age		Family type	
Recorded	70	Nuclear	26
Missing	1	Extended	36
		Living alone	4
		Missing	5
Gender		No, of adults in family	
Male	51	Recorded	
Female	20	Missing	59
Missing	0		12
Marital Status		Religion	
Married	54	Hindus	51
Single	6	Christians	9
Other	8	Muslim	7
Missing	3	Other	1
		Missing	3
Distance (House-hospital)		No, of children in family	
Recorded		Recorded	
Missing	49	Missing	59
	22		12

As evident in table 1 and table 2, in 12 cases uniformly data on family size; number of adults and number of children and age of the head of the family were missing. In 14 cases missing data was on age of the head of the family.

In 22 cases 'distance' was entered by the Resident at intake but was not entered by the person who did the data entry

Table 2 : Distribution of Psychosocial Characteristics of Patients with Dementia

Variable	N-71	Variable	N-71
Family size		Occupation of Head of family	
Recorded	59	Recorded	71
Missing	12	Missing	0
Residence		Family income	
Rural	41	Recorded	71
Urban	8	Missing	0
Suburban	17		
Missing	5	Occupation	
Head of the family		Recorded	71
Recorded		Missing	0
Missing	71		
	0		
Age of Head of family			
Recorded	51		
Missing	20		

Table 3 : Distribution of Clinical Characteristics of Patients with Dementia

Variable	N-71	Variable	N-71
Presence of psychiatric illness		Onset	
Present		Insidious	11
Absent	49	Acute	8
Missing	6	Not applicable	19
	16	Missing	52
Psychiatric symptoms		Subtype of dementia	
Present	50	Alzheimer	18
Absent	19	Non Alzheimer	50
Not mentioned	2	Missing	3
Onset of psychiatric illness		Presence of Physical Illness	
Continuous		Present	
Episodic	17	Absent	22
Not applicable	1	Missing	47
Incomplete remission	51		2
Missing	1		
	1		
Stressor		Family H/O Psychiatric illness	
Present	27	Present	
Absent	28	Absent	31
Missing	16	Missing	34
			6

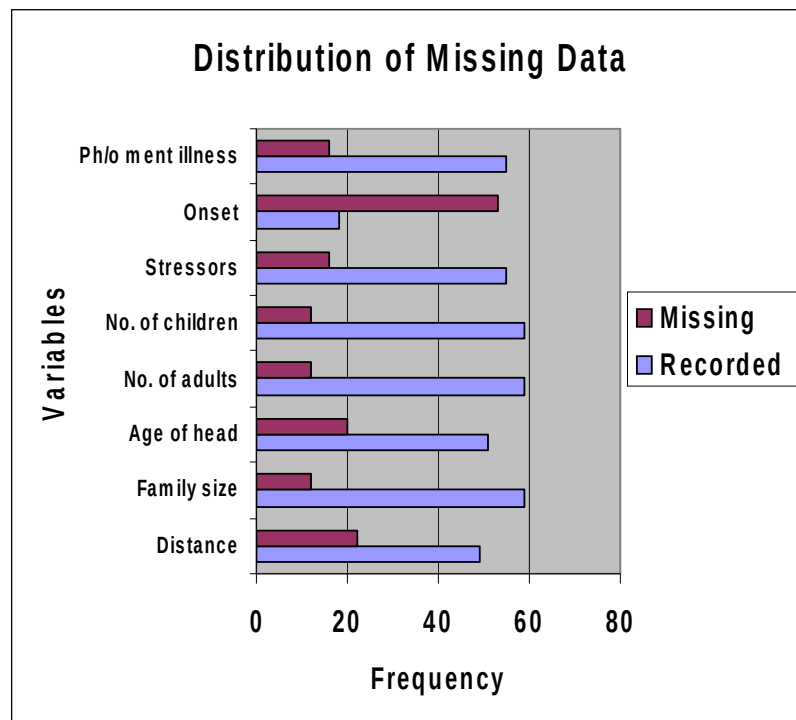
In 52 patients the data on the 'onset of dementia' was missing. In 16 cases the data on the presence of psychiatric illness was missing. Data on other clinical variables which was found missing was negligible.

In the above table in 16 of 71 cases the data on the presence of stressors and in 6 cases family history of psychiatric illness were not recorded in the spread sheets by the person who did the data entry but was found recorded in the case file.(Figure 1)

Data on other clinical variables which was found missing was negligible.

In the above table in 16 of 71 cases the data on the presence of stressors and in 6 cases family history of psychiatric illness were not recorded in the spread sheets by the person who did the data entry but was found recorded in the case file.(Figure 1)

Figure 1 depicts the details of the missing data



Discussion

It is difficult to discern the exact reasons for missingness but some of them are Missing completely at Random (MCAR); missing at Random (MAR); and not missing at Random (NMAR). Some of these categories are Item non-responseLoss due to follow-up, or attrition and mortality (respondent's).

As Little and Schenker (1995) observed item non-response – there are frequently persons not answering all questions in a questionnaire and resulting in item non response which can cause serious problems. Item non-response refers to the fact that due to fatigue, sensitivity about the relevance of the variables to be recorded, lack of knowledge and other factors such as lack of skills respondents not infrequently leave particular items blank on mail questionnaires or decline to give any responses during interviews.

The most trivial reason for missing data is that data was simply not collected. Equipment or sensors can malfunction, a survey can be misprinted, and files can be lost. In a study in which patients are assessed frequently some data are missing at some time points for unknown reasons

Graham and Hofer (2000) made an important distinction between accessible or inaccessible as a cause of missingness. Accessible cause occurs when the cause has been measured (often fortuitously) and it can be included in the missing data model and inaccessible when the cause has not been measured and it is not available for analysis.

In the current study it was intended to find out the reasons for and patterns of 'missingness' and as the details of the Case Records was available the case files were retrieved and examined whether there were really missing data or was there an oversight on the part of the person who did the data entry. In twelve cases uniformly four Sociodemographic variables were missing. In 51 patients were the 'onset of dementia' was thought as missing was in fact 'not mentioned' in the case sheet. In 22 cases 'distance' was entered by the Resident at intake but was not entered by the person who did the data entry.

Insight into the missing data mechanism requires knowledge about which factors contribute to not answering or filling up some columns. When the cause of the missingness is known the missing data

mechanism is called accessible and when included properly in the analyses it will cause no bias even if the data is non randomly missing (Graham & Donaldson 1993). Missing data can influence both the analysis and interpretation of data. No really satisfactory solution exists for missing data, which is why it is important to minimize missingness and try to maximize data collection. . Seven steps to minimizing the amount of missing data are defined as documentation, training, monitoring reports, patient contact, data entry and management, pilot studies, and communication. Although the implementation of these approaches is time consuming and costly, the overall quality of the study is increased. Despite efforts devoted to these areas, no study is without missing data.

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Loneliness, Boredomproneness and Anxiety among Working and Non-working Mothers in a Developmental Sequelae

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ABSTRACT

Women are no longer just the inmates of home. In the global world village of technologically advanced 21st century, they are stepping out of their traditional role of home-makers only and joining the population mass in working sphere. The query seems to be "Is it just a piece of fancy on their part?" or "there are orientational change in their characterology to suit the conditions of the flowing century?" The issue has been addressed within the periphery of selected psychosocial variables, where the findings established their interconnections and brought out distinctly different personality profiles of four selected sub-samples of working and not formally working of early and late aged mothers. The study covered selected variables like loneliness, boredomproneness, anxiety. The sample consisted of two hundred mothers, divided equally in terms of working condition and non-working condition for two age groups. Differences were located in loneliness, boredomproneness and anxiety level. Early aged mothers (both working and non-working) tend to possess less loneliness, boredomproneness and anxiety level than late aged counterparts. In correlational analysis significant interrelationships were established between the selected variables.

Key words : Loneliness, Working women, Late aged mothers, Boredomproneness

In the history of civilization the social folds of human development have changed many a times. A woman's traditionally defined, subordinate, passive and modest roles have been challenged and discrimination in terms of life opportunities is questioned. Research findings (Gove and Tudor, 1973) have pinpointed characteristic distinctiveness of women at formal work from those who remained at home.

Indeed maintenance of domestic front is woman's domain. Interestingly, she receives the least care in terms of health and maintenance, including her food intake which often remains low in calories as well as nutrients. But days have changed in terms of global exposures and formal education, resulting in changes of perspectives even for women. Now a days, employment status provides a new social pedestal to women upon which they become able to establish their identity status. Working women are seen as having well-integrated life mode mingling both the spheres of work and household (Fogarty, Rapaport and Rapaport, 1971).

But life is not static. Every person has to go through the last stage of developmental span, i.e. aging. Considering this period it is inevitable that conjugal and employment characteristics of women are not same. In this context health plays an important role. Even when their health status is comfortable, greater physical demands of job may pose difficulty for community work. Emotional problems are also another catalyst in this domain. Excessive conflict and irritation, guilt feelings affect both home and job status miserably (Payne and Whittington, 1976). The present venture is to draw the mental frames of early and late aged mothers (both working and non-working) in terms of certain relevant psychosocial variables.

The selected variables are conceptually defined as

According to Weiss (1973) "**Loneliness** is caused not by being alone but by being without some definite needed relationship or set of relationships. Loneliness appears always to be a response to the absence of some particular type of relationships or, more accurately, a response to the absence of some particular relational provision

Boredom is a state and **boredomproneness** is a trait- a tendency to experience tedium and lack of personal involvement and enthusiasm to have a general or frequent and lack of sufficient interest in one's life surroundings and future (Smith, 1981).

Anxiety is an alerting signal, it warns off impending danger and enables the person to take measures to deal with a threat (Hurlock, 1997).

Objectives of the present study

The present study aims to verify the profile of these variables - loneliness, boredomproneness and anxiety, in a comparative context of early aged and late aged working and non-working mothers with the following objectives :

1. Do these samples share unique pattern of loneliness, boredomproneness, anxiety owing to their homogeneity in gender only?
2. Do they differ significantly in terms of these selected psychosocial variables owing to their age differences and differences in work status?

METHOD

Sample

In the present study the sample consisted of four groups of mothers (working and house-wives). The sample consisted of 200 individuals. All of them were graduate, belonged to middle class, nuclear Bengali families. The mother tongue of the sample was Bengali. The age range of early aged groups was 35-45 years and late aged groups was 45-55 years. The employed mothers were clerical post-holders in banking service.

Tools Used

- i. Information Blank :** It consisted of informations like age, sex, education, occupation, numbers of family members, total incomes of the family members etc.
- ii. The Revised UCLA Loneliness Scale :** RULS was developed by Russell, Peplau and Cutrona (1980). The original scale consisted of 19 items, but the revised one which was used in the present study was 20 item scale. The reliability of the scale was .94. The concurrent validity of the scale was reported to be satisfactorily high.
- iii. Boredomproneness scale** was developed by Farmer and Sundberg (1986). The scale consists of 28 items. The reliability of the scale was .88 and the validity of the scale was .67.

iv. State-Trait Anxiety Inventory (STAI) was developed by Spielberger (1970). In this study Indian adapted version by Chattopadhyay *et al.* (1986) was administered. The reliability of the scale was .73 for females. The concurrent validity of the scale was satisfactorily high.

Procedure :

Administration of the test

An honest relation was established on the part of the researcher to avoid faking tendency of the participants. Selected tools were given individually and sufficient rest were given to them in order to eliminate their monotony and fatigue. Data were collected from the employees of different government and non-government offices. For house-bound mothers each participants were contacted individually and tools were administered to them. Lastly data were scored following the scoring key and the scores were computed statistically for further interpretation.

Method of analysis

For analysis of data, descriptive statistics-mean, standard deviation, t-test were computed and to find out the degree of relationship between variables coefficient of correlation were calculated.

RESULTS :

Table 1 : Means and Standard deviations and t-values of selected variables Anxiety, Loneliness, Boredomproneness of early aged mothers (both working and non-working groups)

Variables	Early aged mothers				t-test
	Non-working Group (N=50)		Working Group (N=50)		
	M	SD	M	SD	
State Anxiety	20.65	4.86	25.52	5.02	4.92**
Trait Anxiety	19.68	3.79	22.25	3.50	3.52**
Loneliness	20.27	4.56	24.68	4.87	4.69**
Boredom-Proneness	5.69	1.61	4.12	1.53	5.06**

*P>0.05, **P>0.01

Table 1 describes higher mean magnitude in case of anxiety, loneliness and lower mean magnitude in case of boredomproneness on the part of early aged working mothers than their counterparts. It also indicates significant mean differences with respect to all variables among the two groups.

Table 2 : Means and Standard deviations and t-values of selected variables - Anxiety, Loneliness, Boredomproneness of laaged mothers (both working and non-working groups).

Variables	Late aged mothers				t-test
	Non-working		Working Group		
	Group (N=50)		(N=50)		
	M	SD	M	SD	
State Anxiety	39.68	4.40	59.92	4.75	15.76**
Trait Anxiety	39	4.48	52.68	24.91	3.82**
Loneliness	32.18	21.40	58.36	31.90	4.82**
Boreddom-proneness	15.68	2.8	11	4.46	6.32**

*P>0.05, **P>0.01

Table 2 describes higher mean magnitude in case of anxiety, loneliness and lower mean magnitude in case of boredomproneness on the part of late aged working mothers than their counterparts. It also indicates significant mean differences with respect to all variables among the two groups.

Table 3 describes higher mean magnitude in case of anxiety, loneliness and boredomproneness for late aged mothers. It also indicates significant differences with respect to all variables among the two groups.

Table 3: Means and Standard deviations and t-values of selected variables - Anxiety, Loneliness, Boredomproneness of early and late aged mothers (both working and non-working groups)

Variables	Early aged mothers (N=100)		Late aged mothers (N=100)		t-test
	M	SD	M	SD	
State Anxiety	46.17	9.88	92.6	9.15	34.39**
Trait Anxiety	41.93	7.29	91.68	29.39	16.47**
Loneliness	44.95	9.43	90.54	53.3	8.43**
Boredom-proneness	9.81	3.41	26.68	7.26	21.09**

*P>0.05, **P>0.01

Table 4: Correlation coefficients between Loneliness, Boredomproneness and Anxiety of non-working groups of early aged mothers.

Variables	State Anxiety	Trait Anxiety	Loneliness	Boredom proneness
State Anxiety		.00	.31*	.33*
Trait Anxiety			.21	.48**
Loneliness				.32*
Boredom-proneness				

*P>0.05, **P>0.01

Table 4 describes positive correlation between loneliness, boredomproneness, state anxiety and trait anxiety but no correlation between state and trait anxiety.

Table 5: Correlation coefficients between Loneliness, Boredomproneness and Anxiety of working groups of early aged mothers.

Variables	State Anxiety	Trait Anxiety	Loneliness	Boredom proneness
State Anxiety		.00	.30*	.38*
Trait Anxiety			.31	.55**
Loneliness				.28*
Boredom-proneness				

*P>0.05, **P>0.01

Table 5 describes positive correlation between loneliness, boredomproneness, state anxiety and trait anxiety but no correlation between the two dimensions of anxiety.

Table 6: Correlation coefficients between Loneliness, Boredomproneness and Anxiety of non-working groups of late aged mothers.

Variables	State Anxiety	Trait Anxiety	Loneliness	Boredom proneness
State Anxiety		.00	.33*	.31*
Trait Anxiety			.25	.50**
Loneliness				.35*
Boredom-proneness				

*P>0.05, **P>0.01

Table 6 reveals positive correlation between loneliness, boredomproneness, state anxiety and trait anxiety but no correlation between the two dimensions of anxiety.

Table 7: Correlation coefficients between Loneliness, Boredomproneness and Anxiety of working groups of late aged mothers

Variables	State Anxiety	Trait Anxiety	Loneliness	Boredom proneness
State Anxiety		.00	.32*	.29*
Trait Anxiety			.281	.55**
Loneliness				.30*
Boredom-proneness				

*P>0.05, **P>0.01

Table 7 reveals positive correlation between loneliness, boredomproneness, state anxiety and trait anxiety but no correlation between state and trait of anxiety.

Discussion

The statistical findings are being served with following logical explanations. The initial descriptive statistical analysis in terms of means and standard deviations along with further t-test findings seem to be in line with the theoretical contentions of the present topic that “Aging as developmental phase” is expected to have more loadings of problems and more specifically in women population of our country (Patel, 1997; Jamuna, 1998).

The first fold (Table:I) indicates differences located among early aged mothers between working and non-working groups in terms of means, standard deviations and t-ratio.

Anxiety : Considering state and trait anxiety higher, working group of mothers showed higher anxiety level than their counterparts. The reason may be that working women have to deal with harder reality and greater exposures to work sphere. Reality tend to increase the amount of situational anxiety in working mothers. On the other hand, non- employed mothers are concerned with domestic fold and their single role creates less pressures in life situations, they seem to posses less state anxiety (Hoffman, 1986; Kessler and McRae,1982).

Research findings (Feld,1963) indicated that due to greater feelings of inadequacy, multiple responsibilities and job related stress, employed mothers are found to have higher position in trait anxiety. Pleck (1979) conducted that schedule uncertainty, work-load, labour force might alter their work-lives by lowering career aspirations, which increase working mother’s anxiety level.

Loneliness : Comparatively higher score on loneliness of working mothers can be conceived as an associated feature of guilt feelings that makes them to feel inadequate to meet instant domestic needs most of the times. Beal (2006) commented that the working group also faces lack of support as far as house-hold is concerned that increased their feelings of loneliness. Being women and mother despite earning money for the family, their heart cries when they can not attend to immediate domestic demands.Their work status satisfies the masculine aspect of their bisexuality-the feminist aspect weeps at inadequacy and incapability.

Boredomproneness : Probably due to house-hold work and child care non-working mothers scored higher than their counterparts in the area of boredomproneness. Non-working mothers have less time for specific mode of leisure activities, that indicate greater feeling of boredomproneness in them (Oh and Caldwell,1999). Sometimes they exhibit low mood, hopelessness and fewer signs of stress than employed mothers. On the other hand, working mothers till the late age are seen as having a well integrated spheres with respect to both house-hold and working situations (Fogarty, Rapaport and Rapaport,1971). Non working mothers’ narrow spectrum of effective social interaction and less expectation of novelty in daily life, makes the life canvas boring for them. Whereas working ladies’ wider social spectrum and confidence in meeting demands of outside life adds some extra fragrance to enjoy.

The second fold (Table: II) indicates differences located among late aged mothers between working and non-working groups in terms of means, standard deviations and t-ratio with respect to anxiety, loneliness and boredomproneness.

Anxiety : Considering state and trait anxiety, same trend was found in case of working and non-working groups of late aged mothers. The reason may be that excessive pressures of work situations till at

the end life, working mothers tend to react in negative ways in wider range of situations and perceiving them as dangerous or threatening. Not only that due to their poor interpersonal relationships, they are likely to become easy victims of high state and trait anxiety (Kanner *et al.*, 1981). They seem to feel down with age that curtains their social interest and any change in the environment orients them to extra apprehension. The lower age-group seems to have comparatively better accommodativeness regarding basic changes in life.

Loneliness : Probably working mothers perceive themselves as complete without any bodies entrance in their lives and as a result they enjoy full autonomy till the end of day of their lives . Their self-esteem are not bound in any culture-specific definitions of women. This mental attitude sometimes makes them reluctant to enjoy the blessings of conjugal lives than non-working counterparts (Bengston and Gordon, 1985). As a result they receives lack of support, co-operation from their closer ones that increased feelings of loneliness (Beal 2006).

Boredomproneness : Excessive engagement in conjugal and familial lives creates a kind of identity problems for non-working mothers. They have less opportunities to interact with the external world. As a result of which they have time for specific mode of leisure activities and thus fall easy victims of feeling of inadequacy, boredom (Oh and Caldwell, 1999) than their counterparts.

The third fold (Table III) of the study indicates differences located among early and late aged mothers in terms of mean, standard deviation and t-values with respect to anxiety, loneliness and boredomproneness.

Anxiety : Comparing the early and late aged groups it can be commented that ill health, poor acceptability to take proper future plan, negative reactions to wider range of situations, excessive apprehension of meeting any problem in life and overall negative attitude towards life establish late aged mothers (working and non-working) to be maximum sufferers in the dimension of anxiety. Wakkings, Coatas Ferroni (1998) concluded that anxiety is increased with the advancing age. Patel and Broota (2000) also provide the same findings t6hat corroborate the present findings.

Loneliness : Loneliness here has also been proved to be a major catalyst with increasing age. Schmitt and Kurdek (1985) found that the

late elderly mothers expressed more dissatisfaction with their friendships and romantic and sexual relationships. Besides, lick of social support along with poor health status, depression, negative self-concept appear to precipitate loneliness among the late elderly. Anantharaman (1979a,1979b,1980a,1980b,1980c,1980d,1981a,1981b) also commented that lack of adjustment, inability to enjoy recreational activities and pessimistic thoughts among aged were significant indicators of loneliness.

Boredomproneness : Lack of enjoyment in conjugal life, retirement from work, dissatisfaction in interpersonal relationships and also increased amount of loneliness invites excessive boredomproneness in the lives of late aged mothers. Though adequate research findings was not found to support the above statements so on the basis of statistical findings it can be assumed that late aged mothers tend to possess more boredom than their counterparts.

The end part of the study i.e. the correlation coefficients between selected variables revealed a number of significant features.

The correlation coefficients of both age groups of working and non-working mothers on loneliness, boredomproneness and anxiety show pattern of positive relationship among them. Research findings (Stephens and others, 1978) detect that loneliness may create depression and anxiety. It is related to a number of personal characteristics including low self-esteem, shyness, feeling of alienation. Horowitz and French (1979) also reported that loneliness linked to many negative affects including boredom, restlessness, unhappiness and to dissatisfactions with social relationships. It can also be said that gender role wise since female of our country occupy the secondary position in comparison to male so certain features of loneliness, boredomproneness and anxiety pattern are expected among them (Tornstan,1992).

The result table has also proves that correlation coefficients between state and trait anxiety of both age levels for working and non-working mothers are positively correlated with the other variables. Davidson and Cooper (1983) reported that anxiety is the basic feature of present day mothers. In the Indian context the unavoidable extra physical and psychological stress of such mothers probably result in deeper level of anxiety pattern among them (Mukhopadhyay, Dewanji and Majumdar, 1993).Hence statistically significant positive correlation

between anxiety and motherhood with increasing age is well assumed.

CONCLUSIONS :

In sum, the present study has unveiled the following informations:

- Early aged mothers are associated with less anxiety, loneliness and boredomproneness in comparison with late aged counterparts.
- Formal working condition has exposed women to different colouration of outside reality that has in- corporated higher state anxiety and greater loneliness
- Due to lesser dual role stress home-bound women suffer lesser anxiety but have prominent perceptual angle of boredom orientation amidst the colourless daily domestic chores of life.

Hence the verification of the research objectives has laid down the message that it is not gender homogeneity but variations in age folds and formal working status of women that bring different colouration in mental life profiles.

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Adjustments and Problems of Retired Women

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ABSTRACT

Retirement is an important turning point in the life of every working individual. The effects of retirement shock are most serious immediately after the retirement for who have not planned for it by developing interest in other activities, hobbies and social action. Such persons have to struggle to adjust in the changed pattern of life. In this an attempt has been made to find out the problems and adjustment level of retired women. For this purpose 200 retired women were selected from two districts of Kerala. These women belonged to two different religions, social groups and age ranging from 50 (going to retire) to 65 (retired). These women were interviewed personally. It was found that majority of them experienced differently after the retirement. Identification of certain themes as the issues of significance provide insight into the lives of retired and retiring women.

Key words : Retired women, Adjustment, Younger generation, Social Status of women

The "family head" title is now shared by man and woman both in the family, instead of man alone as was in the past. Financial independence is the ultimate frugal goal to achieve for any person, especially for woman.

Women are taking up job, to utilise their potentialities in addition to fulfilling functions as wife and mothers [Kaila,1999]. Women in India have legal equality with men, women now share much more in the benefits of social services both public and private. It always involves role changes, changes in interests and values and changes in the whole

pattern of the individual's life. The status and role of an individual may vary widely during a life time.

Retirement is a rather recent phenomenon in the industrial nations. Retirement arrives as role change at the work place. Retirement is an event in the sense that it is departure from the world of work or it is the termination of a pattern of life or transition to a new pattern of life.

Retirement viewed as a combination of benefits and losses. Retirement entails, a loss of status and prestige, a 'role less' situation where appropriate, or least clearly defined, social positions and role expectations are notoriously absent. Once the person is unable to perform his occupational roles, his claims to prestige, competence and social positions are no longer valid, thus perpetuating the likelihood of identity breakdown. But when one reaches old age he or she is isolated from major roles in the society (Thane,1987).

The effects of retirement shock are most serious immediately after retirement.

As a sociological event retirement is a formal withdrawal from the occupational field necessitating a complete re-orientation on the part of the individual with regard to lifestyle and group life .

The individual must adjust to change in routine and to the breaking off social relationship. The women always has an advantage, is that she experiences no sudden discontinuity in her family roles or daily activities but she is likely to have more problems than her husband in making adjustments at home.

Retirement is a major challenge for many elderly people especially those who have not planned for it by developing other interests, hobbies and activities.

Adjustment to retirement

The term adjustment refers to the internal and external equilibrium of human organisms. It has been used mostly to refer to the state of harmony not only within the environment. Economic, social, familial and psychological adjustments are required to cope up with retirement.

Although most older adults cope effectively with the changes associated with retirement, approximately one third of the adult report significant difficulty during this process. Retirement may bring reduction in stress, especially coping with challenges and crisis at the work place. Working women on the whole adjust better to retirement than men. There are several reasons for this. First, the role change is not as radical because, for the most part women always played the domestic role, whether they were married or single, through out their working years, in addition to their work role. Secondly retirement is less traumatic for them than for men. Thirdly, as only few women have held executive positions, so they do not feel that they have lost all their power and prestige.

Unmarried women as a group, adjust better to retirement than housewives because they have more social resources to fall back on to fill their free time[Hurlock,1999].For men, there is a free life after retirement. But, some women lead a more busy life at home after retirement. The women strive to be their own person, more independent of the people around them. John[1999] found that retirement adjustment is associated with age religion, educational status, post retirement income, pre-retirement occupation and not with gender.

The effects of retirement shock are most serious, when the individual adjust themselves to changes in the routine and also during the breaking off of social relationship. According to Nair [2000], lack of money reduces power and social status among retired women. Mental agony and torture leads to sleepless nights among retired women (Bali, 1994). After retirement, the women face a problem of making use of their extra hours which are now at their disposal. Unawareness of leisure time activities and lack of confidence in retrieving their old hobbies worsen their problem.

Three factors that seems to influence retirement adjustment include planning for it, perceptions of it, and the extent of income loss. Retirement is found to be a major problem in developed countries too A study done at Washington by Szinovacz [1982] revealed five adjustment problems of retired women such as use of time, health, friends, activities and expenses. The data further suggested that it is particularly women

in the lower socio-economic status groups experience retirement problems and have difficulty adjusting to the retirement transition. Low income retirees lack the means to attend expensive entertainment, but lack of economic resources and skills also prevents them from pursuing less costly leisure activities. Lack of educational skills also hinders these women's abilities to develop meaningful hobbies at home. Some of the low -income were functionally illiterate and thus unable to read and they spend a lot of time watching TV or what they call 'resting'.

But, most of the professional women retirees were quite satisfied with being retired. Also reported that after retirement they were able to enter into new careers, friendship network, linkage system to family members, good health, satisfactory use of leisure time.

Keeping in view above mentioned views the present study was conducted in two districts of Kerala in order to compare the adjustment problems of retired women from the southern and northern parts of Kerala. The southern district Thiruvananthapuram and one of the northern district Malapuram were selected. Socially, economically and culturally there is a vast difference between these two districts which provided insight into the lives of retired women. The major objective of this study was to elicit maximum information regarding the life of retired women before and after retirement and also their extent of adjustments.

Method

Sample : Two hundred retired women were selected for the study from two districts of Kerala and equal number of women (N=100) were interviewed from each district. The sample consisted of different professional groups such as teachers, nurses, clerks and attenders. Multistage sampling was done to select the sample.

Tool used : Details of personal data, familial adjustment, adjustment due to change of status, economic, psychological and social adjustments, health problems and leisure time activities etc were gathered from women through informal interview.

Table -1 reveals the personal data of the interviewed retired women.

Table 1 : Personal data of the selected retired women

Sl. No	Personal data	Thiruvananthapuram (N=100)	Malappuram (N=100)
1	Age range		
	56-60 years	66	60
	61-65 years	34	40
2	Status of Religion		
	Hindu	82	84
	Christain	16	14
	Muslim	2	2
3	Social group		
	Forward caste	50	76
	Backward class	36	22
	SC/ST	14	2
4	Place of residence		
	Rural	10	92
	Urban	90	8
5	Type of family		
	Nuclear	92	80
	Joint	8	20
6	Size of family		
	1-3 numbers	54	60
	4-6 numbers	46	40
7	Educational Qualification		
	Below SSLC	4	4
	SSLC	48	80
	PDC	28	14
	Graduation	16	12
	Post Graduation	4	—
8	Marital status		
	Unmarried	—	2
	Married	74	72
	Widowed	26	26
9	Year of retirement		
	1990-95	34	40
	1995-2000	66	60
10	Occupation		
	Teacher	50	84
	Nurse	30	10
	Clerk	16	2
	Others	4	4

[primary source]

Findings :

Retired persons often face loss of status loneliness and alienation from the family and society. Thus it seems relevant to examine the relationship with their family members. Hence enquired about how they get along with other family members. The details are given in Table 2.

Table 2 : Relationship with other family members

Family Members	Relationship			
	Thiruvananthapuram		Malappuram	
	Friendly	Affectionate	Friendly	Affectionate
Husband	52	48	78	22
Son/daughter	46	54	68	32
Others	52	48	70	30

[primary source]

Retired women at Malappuram were found to be more friendly than women at Thiruvananthapuram, while women at Thiruvananthapuram were found to be more affectionate. The emotional attachment of the grand children with retired women were also studied and found to be almost same among women in Thiruvananthapuram and Malappuram.

One of the problems of old age is associated with family negligence. The retired persons are not able to contribute or involved in major decisions. Study on change in decision making power in family matters, before and after retirement revealed that (Table 3), there is a considerable ['Z' value-7.6* significant] change in it.

The decision making power seems to be increasing after retirement. This may be due to fact that the women are available at home after retirement and their positive attitude to involve in household activities. But it is interesting to note that the women in Thiruvananthapuram seemed to be very independent, while the families in Malappuram take most of the decisions jointly. Further statistical analysis showed the income of the retired women did not have any relationship with the decision making process of the family.

Table 3 : Involvement in major decision making on family related matters by retired women before and after retirement

Major decisions	Persons who take decisions					
	Thiruvananthapuram			Malappuram		
	Yourself	Husband	Together	Yourself	Husband	Together
Before-Economic	36	16	48	20	16	64
Household	36	16	48	22	14	64
Education	34	18	48	18	14	68
Recreation	36	14	50	18	12	70
After-Economic	40	14	46	26	14	60
Household	40	14	46	30	14	56
Education	38	16	46	26	14	60
Recreation	40	12	48	26	12	62

Z-Value=7.6*

[primary source]

* Significant[Table value=1.645]

Social, cultural and economic difficulties can cause stress to individuals. Events such as loss of job, social status, ending of a relationship, widowhood and for that matter even ill health may trigger episodes of depression. Hence the emotional change of women after retirement were also studied. Table 4 gives the details.

Table 4 : Emotional change after retirement

Emotional level	Thiruvananthapuram	Malappuram
No change	60	72
More strong	32	20
Depressed	8	8

[primary source]

It may be observed from the table that majority of retired women [60% in Thiruvananthapuram and 72% in Malappuram] were found to be emotionally fit, while 32% in Thiruvananthapuram expressed that they have become emotionally more stronger after retirement. Depression was hardly noticed in both districts.

Table 5 Depicts that the major assets of retired women found to be unchanged even after retirement.

Table 5 : Major assets before and after retirement

Assets	Thiruvananthapuram		Malappuram	
	Before-retirement	After - retirement	Before-retirement	After - retirement
House	48	48	50	50
Land	39	39	50	50
Car	6	6	5	5
Two wheeler	8	9	2	2
House hold equipments	43	43	38	38

[primary source]

It can be concluded that the economic status of women had not declined after retirement, even though the total income is found to be decreasing.

Majority of the retired women have savings for future, but 40% at Thiruvananthapuram and 30% at Malappuram revealed that they do not have enough savings for the future.

Table 6 : Savings for the future

Saving for future	Thiruvananthapuram	Malappuram	Total
Have enough	60	70	130
Not enough	40	30	70
Total	100	100	200

Chi square value 1.09^{ns} [ns-not significant]

[primary source]

While eliciting the attitude of retired women towards seeking new job, 34% of women at Thiruvananthapuram and 18% at Malappuram were found to be seeking job, even after retirement.

Table 7 : Seeking for a new job

Seeking job	Thiruvananthapuram	Malappuram	Total
Yes	34	18	52
No	66	82	148
Total	100	100	200

Chi square- 3.33^{ns} [ns-not significant]

[primary source]

Interest to involve in various activities and to develop hobbies found to be increasing among women in both the places after retirement. Table-8 gives the details.

Table 8 : Major interests before and after retirement

Major interests	Thiruvananthapuram		Malappuram	
	Before	After	Before	After
Reading	37	45	44	50
Watching TV	32	40	27	35
Playing with grand children	7	26	8	30
Domestic activities	18	20	16	18
Chi square value	8.423285 ^{ns}		8.163147 ^{ns}	

ns-not significant

[primary source]

Analysis of the health status revealed that 64% of Thiruvananthapuram and 76% in Malappuram district have no change in the health after retirement, while 36 % in Thiruvananthapuram and 24 % in Malappuram expressed that their health is deteriorating due to common ailments such as blood pressure, diabetics, asthma, arthritis etc.

Religious faith and time spent on religious activities were found to be increasing after retirement ,may be due to the fact that retired women have less responsibility and more leisure time.

During data analysis it became apparent these women were describing not only the process of retirement but were also making recommendations and identifying experiences from which future female retirees could benefit. These “words to retire by” can serve as a foundation for future program development in the area of women’s retirement as well as further study. Five themes were clearly identified as issues of significance for women planning to retire:

1. Setting goals,
2. Avoiding retiring too early,
3. Getting involved,
4. Managing time, and
5. Being self-sufficient.

Theme 1 : Setting goals

The women repeatedly emphasized that planning for financial security in retirement was an important issue. This emphasis was largely a result of the women not practicing financial planning themselves. Roughly 65% of the women in this sample admitted considerable regret about their lack of financial preparation and strongly urged women to set financial goals and start saving for retirement at a young age.

Included in this recommendation to financially prepare was a warning for women not to depend on husbands to manage the retirement preparation process. Many of the participants, despite being employed, lived in an era when men were the family breadwinners and women were not socialized to concern themselves with money matters. The women in this sample cautioned against making the outdated assumption that retirement was not a “woman’s issue.”

The women also emphasized the need to set goals for retirement beyond issues of economic security. For example, taking up a new hobby or practicing an existing hobby with more vigour, deciding with whom they want to spend their time, and identifying activities that give every day a sense of purpose and meaning. The women suggested setting specific goals for retirement and revisiting and evaluating these goals regularly as a way of ensuring an active and interesting retirement.

Theme 2 : Avoiding retiring too early

Because women are likely to live, on average, seven years longer than men, they can expect to spend as much as 25% of their adult years retired. When a woman outlives her husband, her income decreases by 50 percent on average yet expenses only decrease by 20 percent, A number of the women, as a result of their own miscalculations about the length of their retirement, cautioned future retirees not to retire too early.

A common suggestion was for women to evaluate the long-term stability of their finances considering the extended duration of most women’s retirement years. For those women who still experience gratification and enjoyment as a result of their employment, continuing to work for a few more years was strongly recommended. Retiring from a position that serves as a source of identity and satisfaction

should not be done in haste or as a result of reaching a specific chronological age.

Theme 3 : Getting involved

In addition to setting goals and timing one's retirement carefully, the importance of maintaining interactions with others in retirement was also discussed. Included in this recommendation were three areas of emphasis. First, the need to maintain contact and interaction with people was viewed as an important replacement for lost work contacts.

Second, involvement was described as a way to find meaning and feel productive on a daily basis. Many of the women reflected on how they missed doing for others or feeling needed once they retired. As a result, women were involved in some type of supportive role either in their communities as a volunteer or in their families.

Third, the women also pointed to the importance of reaching out to others to establish and maintain contact in retirement. A common misconception among the women, early in retirement, was that relationships would just "happen" as they did when they were working. Instead, the women found they had to find opportunities to interact with others and work to maintain that contact.

Theme 4 : Managing time

At the same time these women discussed the importance of involvement, they also described feeling overwhelmed with activities and demands on their time. As a result, it was suggested that new retirees begin retirement by managing their time wisely. Specifically, the women felt establishing a daily routine was essential in retirement.

By having a schedule, the women were able to find purpose and meaning on a daily basis. Although the women could sleep until noon and spend their days leisurely, no woman chose this option. After brief periods of leisure directly following retirement, the women from both professional and non-professional backgrounds emphasized the value they placed on organizing their time.

In conjunction with the importance of managing time, the women also advised using caution in one's initial decisions and time commitments upon entering retirement. One type of caution concerned not getting involved in activities too quickly or committing to something right away.

The women felt strongly that they had earned the right to be choosy in how they spent their time.

Theme 5 : Being self-sufficient

Many of the women accurately pointed to the reality that women, as a result of their longevity, will likely spend a portion of their retirement alone. As a result, they felt it was important for retiring women to recognize this likelihood and prepare to live independently.

Secondly, the women warned against depending on family members to fill one's needs in retirement. Essentially, the women advised that depending on family would result in burdening them or becoming bitter when family did not meet their expectations.

Third, a common warning, primarily for married women, was to be informed about financial, legal, and property matters.

Finally, the women emphasized the importance of maintaining skills and decision-making in retirement. The women warned those who relinquish these skills will inevitably be disadvantaged when they must rely on themselves.

Conclusions

As the labour force participation rates of women continue to increase and retirement for women will become a more commonly recognized transition. As a result, Extension educators will be required to respond to the needs of their counties and communities by providing appropriate programming that targets the needs and concerns of retired women.

The results of this study reveal that issues of significance for retired women go beyond financial security and include the importance of goal setting, social relationships, and personal responsibility. It is proposed, however, that developing program materials that emphasize the psychosocial components of retirement (for both men and women) are needed. Because women display more divergent work histories, have greater family responsibilities across the life span, and spend more years in retirement than men, their transitional experiences do differ from men and warrant individual attention.

Suggestions for implementing a broader approach to retirement planning include:

1. Increasing public awareness about women's retirement.
2. Offering programs that emphasize the unique nature of retirement for women.
3. Encouraging retiring women to :
 - Evaluate their personal relationships and social support networks prior to retirement.
 - Identify personal goals they might accomplish once retired. These subjective goals may vary from recreational interests and hobbies, to home improvement tasks, to personal self-analysis.
 - Consider, often for the first time, what their own needs are without first considering the needs of others around them.
 - Identify interests or activities that provide a sense of personal fulfillment.
 - Consider utilizing either former work-related skills or other personal talents in part-time work or in a volunteer capacity.
 - Maintain or develop skills that will contribute to their self-sufficiency.

Although additional research exploring women's retirement is needed, Extension educators can begin to enhance existing retirement programming by recognizing women's retirement, addressing issues specific to women's work and life histories, and targeting young and mid-life women who can benefit from the growing knowledge about women's retirement.

Retirement should be considered as the time of greatest personal liberation, a time for the mind and spirit to flourish. After retirement one can reach out to new ideas and new ways of thinking. It should be considered as an opportunity for self development. One should not simply retire from something but he and she should have something to retire.

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Levels of Physical Activity, Functional Autonomy and Quality of Life in Elderly Women Practitioners of Formal and Non-Formal Physical Activities

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ABSTRACT

The objective of this study was to evaluate the levels of physical activity, functional autonomy and quality of life in elderly women (N = 122) practitioners of physical formal and non formal activities. These women were enrolled in a Family Health Unit from the city of Crato (Ceará-Brazil). To determine the level of physical activity, the Baecke Questionnaire Modified for Elderly People was used and the functional autonomy was assessed by the battery of tests of the Group of Latin American Development to Maturity (GDLAM). The statistical treatment comprised descriptive and inferential analysis. The data were analyzed through the SPSS, 16.0 version for Windows. The level of significance and statistical error considered were 5% ($p < 0.05$). It was observed that the elderly women practitioners of formal physical activity presented better results for the levels of physical activity (overall Baecke=4.45) and functional autonomy (IG=29.81) when compared to the elderly women non practitioners of formal physical activity (general Baecke = 1.71 and IG=48.91). It is recommended to conduct further studies, aiming to analyze the relation of physical activity with functional autonomy and quality of life with a view to emphasizing the importance of the systematic practice of exercise in improving the overall health status of the elderly individual.

Keywords: Elderly; Physical activity; Quality of life; Functional autonomy.

Considering the apparent increase in the elderly population, more strategies are being searched in order to promote a better quality of life and autonomy of this population segment. Thus, physical activity has been gaining increasing significance in the promotion of the elderly's health.

The study of functional autonomy in the elderly people is important to understand how people live the year gained with increased longevity. In countries where the aging process is not recent there is more knowledge on the patterns of functional capacity. But in Brazil, there are few studies involving this issue (Lima *et al.*, 2003; Melzer and Parahyba, 2004).

The concern to promote a better quality of life for the elderly, has proven important in scientific studies of physical activity as adjuvant in prophylactic and therapeutic process of certain chronic diseases (Blay and Marinho, 2007; Matsudo, 2002; Stela *et al.*, 2002).

Based on the apparent increase in the elderly population in Brazil it is important to find strategies to encourage improved quality of life and autonomy of this population segment. Thus the practice of physical activity has been gaining significance in the promotion of health among the elderly.

Considering the above, the present research aimed to evaluate the levels of physical activity, functional autonomy and quality of life in elderly women practitioners of formal and non formal physical activities.

Methodology

The sample consisted of 122 elderly women, practitioners of physical activities, with age equal or superior to 60 years-old (67.9+/-6.9), voluntary, enrolled in an unit of Family Health Strategy from the city of Crato (Ceará-Brazil), in the months of September to November 2008, upon acceptance to participate in the study, according to 196/96

resolution from the National Health Council (Brazil). The ethical precautions of the research were corroborated by the approval of the project in the Ethics Committee in Research from the Castelo Branco University (UCB-RJ) under the No 0159/2008.

Based on the type of physical activity performed, the participants of the research were divided into two equal groups of 61 elderly women practitioners of formal physical activities- AFF (walk 3 times a week for 30 minutes, at least for 3 months with 75% of presence in this activity) and non formal physical activities- AFNF (daily activities that result in energy expenditure, but not performed in order to exercise).

Aiming to know the level of physical activity, it was used the version of the Baecke Questionnaire Modified for Elderly People (QBMI), which assesses the level of physical activity in three areas: work performed at home, sports and leisure activities. To assess the level of physical activity, the values are added, understanding that the valence is directly proportional to its respective classification, that is, the higher the values (score), it increases the level of physical activity (Voorrips *et al.*, 1997).

The Quality of Life (QOL) was assessed using the instrument WHOQOL-OLD modified for elderly people, which assesses the QOL in six Domains: Functioning of the Sensory, Autonomy, Past, Present and Future Activities, Social Participation, Death and Dying and Intimacy, where high scores represent a high quality of life (Fleck *et al.*, 2003).

For the assessment of Functional Autonomy, the elderly women were submitted to a battery composed by five tests adopted in the protocol for functional assessment of the Group of Latin American Development to Maturity (GDLAM): walking 10m - C10 (Sipila *et al.*, 1996); standing up from a seated position - LPS (Guralnik *et al.*, 1994); standing up from the ventral decubitus position - LPDV (Alexander *et al.*, 1997); standing up from the chair and move across the house - LCLC (Andreotti and Okuma, 1999); and the test to dress

and undress a T-shirt - VTC (Vale *et al.*, 2006) All these tests are used to calculate the GDLAM-IG Index, (Dantas and Vale, 2004). Lower scores measured in seconds, in this instrument, represent a better level of functional autonomy.

Data analysis was performed using the SPSS statistical package, 16.0 version for Windows. The results of the descriptive statistical analysis are presented with average, median, standard error and standard deviation. For inferential analysis it was used the t- Student test in order to observe the statistical differences between the two groups. For all procedures, it was adopted a trust interval of 5% ($p < 0.05$).

RESULTS

The results of tables 1 and 2 present the descriptive and inferential statistics of the level of physical activity and quality of life of elderly women practitioners of AFF and AFNF.

Table 1 : Physical activity level instrument BAECKE and its components, of older people enjoying AFF (n = 61) and AFNF (n = 61), registered in a family health unit of crato-CE

		Average	Standard deviation	Standard error	Median	T
Domestics	AFF	2,09	0,37	0,05	2,1	5,163**
	AFNF	1,71	0,44	0,06	1,8	
Leisure	AFF	2,36	1,63	0,21	3,15	11,272**
	AFNF	0,00	0,00	0,00	0	
General	AFF	4,45	1,70	0,22	4,75	12,129**
	AFNF	1,71	0,44	0,06	1,8	

F (test of Levene), t (test of student), ** $p < 0,01$ (statistically significant differences between groups AFF x AFNF).

The values obtained by participants in the questionnaire of Baecke showed statistically significant differences between the average values of the scores from each classification generated, considering a $p < 0.05$,

in addition, the scores of BAECKE in the group of AFF were better when compared to the values from the group of AFNF.

Table 2 : Functional second level of autonomy of older GDLAM Protocol practitioners AFF (n = 61) and AFNF (n = 61), registered in a family health unit of Crato-CE.

		Average	Standard deviation	Standard error	Median	T
C10M	AFF	7,21	1,69	0,22	6,75	-12,067**
	AFNF	12,49	2,98	0,38	12,00	
LPS	AFF	10,49	2,97	0,38	10,00	-10,715**
	AFNF	18,87	5,34	0,68	18,00	
LPDV	AFF	3,75	2,16	0,28	3,10	-4,241**
	AFNF	7,61	6,77	0,87	6,00	
VTC	AFF	16,19	5,40	0,69	16,00	-3,889**
	AFNF	20,34	6,37	0,82	19,00	
LCPC	AFF	43,99	8,52	1,09	44,00	-13,561**
	AFNF	77,00	16,99	2,18	76,00	
IG	AFF	29,81	6,25	0,80	28,63	-11,965**
	AFNF	48,91	10,78	1,38	48,25	

C10m = walk 10 metres; LPS = lift the seating position; LPDV = raise ventral decubit pad position; LCLC = Chair lift and move by House; IG = índice GDLAM, t (test of student), ** p < 0,05 (statistically significant differences between groups AFF x AFNF).

Table 2 presents the level of Quality of life according to the WHOQOL-old, from the elderly women practitioners of AFF (n=61) and AFNF (n=61), enrolled in a Family Health Unit of Crato-CE.

It is verified that the elderly women from the group of AFF obtained the best results, with statistically significant difference (p<0.05) for all tests, but according to the GDLAM protocol, we observed that the functional autonomy of the two groups was considered weak (IG>27.42).

Table 3 : The quality of life second WHOQOL-old, of older people enjoying AFF (n = 61) and AFNF (n = 61), registered in a family health unit of Crato-CE.

		Average	Standard deviation	Standard error	Median	T
Domain 1	AFF	10,33	2,68	0,343	10,0	-2,484**
	AFNF	9,20	2,34	0,300	9,0	
Domain 2	AFF	14,44	2,65	0,339	15,0	-6,265**
	AFNF	11,49	2,56	0,328	12,0	
Domain 3	AFF	16,03	1,99	0,255	16,0	-5,269**
	AFNF	13,26	3,59	0,460	14,0	
Domain 4	AFF	15,84	1,80	0,230	16,0	-5,569**
	AFNF	13,16	3,29	0,421	13,0	
Domain 5	AFF	9,90	4,45	0,570	11,0	-2,013**
	AFNF	11,34	3,39	0,434	12,0	
Domain 6	AFF	13,74	2,97	0,381	15,0	-1,725
	AFNF	12,85	2,69	0,344	13,0	
Qvg	AFF	13,38	1,27	0,163	13,3	-5,224**
	AFNF	11,89	1,84	0,236	12,2	

Dom1 = functioning of Matt Damon, Dom2 = autonomy Dom3 = past, present and future social participation, Dom4 = Dom5 = death and dying, intimacy, Dom6 = qvg-old = general quality of life, student's t test (** p 0.05 (statistically significant differences between the groups AFF x AFNF).

This table presents the Level of quality of life according to the WHOQOL-OLD, from the elderly women practitioners of AFF (n=61) and AFNF (n=61), enrolled in a registered Family Health Unit from Crato-CE.

There are statistically significant differences in all domains (except for domain 6) and overall QOL from the WHOQOL-OLD on the involvement in physical activities.

DISCUSSION

It is observed in Table 1 that the scores of QBMI found in both groups (AFF=4.45, AFNF=1.71) are well below the values of similar studies involving elderly people. It is taken as example the study Miyasike (2000), conducted with 61 elderly people divided into three groups, where, through Baecke, it was found an average of 3.19 points for a

group of sedentary elderly and in two other groups of physically active elderly people, averages of 8.53 and 7.82 points. The fact that the elderly women of this research do not practice any type of sports activity may have contributed to the low levels of physical activity found.

However, statistically significant differences were noted in results when comparing the two groups, that is, the elderly women from the group that practiced AFF, despite presenting lower scores than expected, obtained better results in QBMI than the elderly women practitioners of AFNF. Contributing to the assertion that the practice of only of daily life activities, does not guarantee the same level of physical activity compared with the practice of formal physical activity (Gobbi *et al.*, 2006).

The battery of tests of GDLAM (table 2) is similar to the daily life activities and has been widely used in assessing the functional capacity of elderly (Boechat *et al.*, 2007; Paula *et al.*, 2008). According to GDLAM, it is observed that the elderly women practitioners of AFF obtained more significant results than the elderly women from the group of AFNF. These results are in accordance with studies by Vale *et al.* (2005) that analyzed through GDLAM the autonomy of 36 elderly women divided into two groups, one from flexibility training (GFLEX, n=18) and another from resisted strength training (GFOR, n=18). The GFOR and GFLEX groups showed variations of -22.3 ± 7 and -18.5 ± 8 for autonomy, respectively. Concluding that the GFOR achieved greater increases in daily life activities with the experimental treatment.

Similarly Guimarães *et al.* (2008) compared the autonomy in a group of elderly women practitioners (n=35) of walking with a group of sedentary elderly women (n=35), observing significant results in the elderly women trained (IG=27.33) when compared with those not trained (IG=29.31) by the battery of GDLAM tests.

According to table 3, it is observed that the elderly women from the group of AFF presented better levels of QoL than the elderly women from the group of AFNF. Studies by Castro (2008) also showed similar results regarding QVG-Old in elderly women practitioners of regular physical activities. According to Néri (2006), the more active the elderly, increased will be their satisfaction with life and, consequently, the better their quality of life.

Based on the results of the WHOQOL, we note that 70% of the group practitioner of AFF and 60% of the group of AFNF achieved quality of life levels classified as medium (13.38 and 11.84). In similar surveys, Figueira (2008) and Verma (2008) analyzed the QOL of elderly people and observed that 48% and 51% respectively, presented satisfactory levels of QOL.

We have adopted as the basis for this classification, the studies by Mello (2008), using the same instrument in the elderly, presenting the average for QVG-Old (13.17) similar to that found in this study. It proposes a categorical classification of the WHOQOL-OLD, where scores between 14.1 and 20 correspond to high QOL, between 11 and 14 to average QOL and scores below 10.9 mean low QOL.

The results found in the research indicate that people who remain with low levels of physical activity throughout life will suffer effects of aging with greater impact, however, those who remain physically active tend to get a better quality of life (Vale *et al.*, 2004).

CONCLUSIONS

This research concluded that the group practicing AFF showed better results in evaluations performed, indicating that participation in a program of formal physical activity is able to contribute to the increased level of physical activity with impact on quality of life and guarantee of higher personal independence. It is recommended to conduct further studies, aiming to analyze the relation of the practice of physical activity with functional autonomy and quality of life with a view to emphasizing the importance of the systematic practice of exercises in improving the overall health status of the elderly individual.

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Wisdom, Cognitive-failure, Depression and Loneliness among Older Men

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ABSTRACT

The present study aims to explore the relationship of wisdom, with cognitive failure, depression and loneliness among older men. Three-dimensional wisdom scale containing - cognitive (C), affective(A), reflective(R) dimensions, UCLA loneliness scale, Geriatric depression scale, and Indian adaptation of Cognitive-failure scale, and an interview schedule were administered to 50 Varanasi residents, 60-64 yrs (N=25) and 65+ yrs (N=25) from middle socioeconomic status, minimal education up to graduation. Age related comparisons indicate no differences on any of the dimensions of wisdom, cognitive-failure, depression or loneliness. Correlational analysis, however, revealed Wisdom-C to be negatively associated with cognitive-failure for 65+yrs group and with loneliness for 60-64yrs group only, but was unrelated to depression. Wisdom-A was negatively associated with cognitive-failure, loneliness and depression for 65+yrs group only. Wisdom-R, having the most prominent effect, was negatively associated with cognitive-failure for the older group only but with both depression and loneliness for both the age groups, with correlations being higher for the older age group. Cognitive-failure was positively associated with loneliness for both age groups, but was unrelated to depression. However, depression and loneliness were positively associated only for the older group. Comparison of high and low wisdom (Ss divided on the basis of total wisdom scores) indicated high wisdom Ss to be scoring lower on cognitive failure, depression and loneliness than the low wisdom group. The high and low wisdom groups were also compared on certain demographic variables as well as

their perceptions regarding problems of aging, social interaction etc. Analysis of results has been presented in the light of socio-demographic information and theoretical background.

Key Words : Wisdom, Cognitive Failure, Loneliness, Depression, Social Interaction, Older Men.

Old age is the period generally associated with decline in physical, as well as psychological functioning. However, even if physical declines may be imminent, it is empirically observed that a number of older people retain their cognitive functioning and find themselves more capable of facing the challenges of old age and declines commonly associated with aging. It, therefore, is essential to explore those aspects which lead to successful aging.

Wisdom

In the Hindu tradition, life is divided into four stages, each with its own characteristic features and functions. The last and fourth stage of life is exclusively reserved for the pursuit of spiritual realization and wisdom, which can add meaning to the enhanced life span of an individual. Wisdom is a basic developmental goal of human life, and older individuals have unique privilege of concentrating on the development of wisdom and thus help themselves as well as the younger members of the society.

Wisdom is a complex concept and has been defined in various ways by different authors. Wisdom has been defined as “expertise in the conduct and meaning of life (Baltes & Staudinger, 2000), the application of tacit knowledge as mediated by values toward the achievement of common good through a balance among multiple (a) intrapersonal (b) interpersonal and (c) extra personal interests in order to achieve a balance among (a) adaptation to existing environment (b) shaping of existing environment and (c) selection of new environment (Sternberg 1998). Ardel (2003) defines wisdom ‘as an integration of cognitive, reflective and affective dimensions’ (2003). The three dimensions have been further explained by her as follows:

- (a) Cognitive Dimension: It refers to a person’s ability to understand life, that is, to comprehend the significance and deeper meaning of phenomena and events, particularly with regard to intrapersonal and interpersonal matters. This includes knowledge of the positive

and negative aspects of human nature, of the inherent limit of knowledge, and of life’s unpredictability and uncertainties.

- (b) Affective Dimension: It relates to the presence of positive emotions, behavior toward other beings and the absence of indifferent or negative emotions and behavior toward others.
- (c) Reflective Dimension: It is prerequisite for the development of cognitive and affective dimension of wisdom. A deeper understanding of life is only possible if one can perceive reality as it is without any major distortion. To do this, one needs to engage in reflective thinking by looking at phenomena and events from many different perspectives to develop self awareness and self-insight. This practice is expected to gradually reduce one’s self-centeredness, subjectivity and projections and increase one’s insight into the true nature of things, including the motivations of one’s own and other people’s behavior. The reflective dimension of wisdom is the crucial component among the three because it encourages the development of both the cognitive and affective element of wisdom (Ardelt 2000).

Wisdom and Aging Well

Wisdom is a strong predictor of aging well. Wise older people are expected to age more successfully than do those low on wisdom, (Baltes, Smith & Staudinger, 1992), and is found to be associated with a multitude of positive characteristics, such as ego integrity and maturity, judgment and interpersonal skills, and an excellent understanding of life (Clayton 1982, Dittmann-Kohli & Baltes, 1990). Hence wisdom in old age is assumed to be positively correlated to mental health, satisfaction with life, ability to cope with physical and social decline and nearing of death (Orwoll & Achenbaud, 1991, Bianchi 1994). Wisdom is found to be positively correlated with life satisfaction, wisdom helps a person to cope well in the face of difficulties. Ardel (1997) found a strong correlation between wisdom and life satisfaction, and it was most powerful predictor of life satisfaction in old age for women. It was also found correlated with good family relation and with physical health and unrelated to socioeconomic status, financial situation and physical environment (Ardelt 2000). Helson and Shrivastava (2002) found that achievement via independence and psychological mindedness was associated with higher level of wisdom. Creative achievement and

wisdom was found correlated with sense of personal growth. Wisdom was also found to be associated with positive relation with others. These results indicate that a person with higher level of wisdom, are able to better cope with obstacles in life, use active coping strategies, have higher level of personal growth, have good relationship and social interaction with other and extract positive information from all the situation and so are more satisfied with life.

Wisdom related knowledge is obtained through personal life experiences, self-reflection, self-awareness, and the transcendence of one's subjectivity and projections. Hence the acquisition of wisdom related knowledge takes time (Jarvis 1992, Kekes 1983, Karamer 1990). Therefore only few individuals reach a higher state of wisdom. But the possibility exists that higher levels of wisdom may be achieved as one grows older provided the other cognitive abilities remain intact. Since wisdom by definition has cognitive aspect as one of its components it may be assumed the cognitive failure may influence the various aspects associated with wisdom on the other hand the relationship may also be reverse and an exploration into this issue is warranted.

Cognitive Failure

One of the major aspects of cognitive functioning of older people relates to the age related decline in memory which interferes with day to day activities and has been accepted as an aspect of normal aging. Burke and Mackay (1997) in their review of empirical research on age-related changes in memory and language comment that a consistent pattern of spared and impaired abilities in normal old age. Relatively preserved in old age is memory performance involving highly practiced skills and familiar information, including factual, semantic and autobiographical information. Relatively impaired in old age is memory performance that requires the formation of new connections, for example, recall of recent autobiographical experiences, new facts or the source of newly acquired facts. This pattern of impaired new learning versus preserved old learning cuts across distinctions between semantic memory, episodic memory, explicit memory and perhaps also implicit memory. However, familiar verbal information is not completely preserved when accessed on the output side rather than the input side: aspects of language production, namely word finding and spelling, exhibit significant age-related declines.

Hess (1999) also believes that age related decline in memory and cognitive functioning is not as much pronounced as once believed. Older adult are more capable on some tasks. On the basis of his study he concluded that, older adults performed on par with younger adults at judging a person's character and competence. Middle-aged and older adults can make more complex judgment because they focus on the most meaningful factors that could impact on individual's behavior. Although some basic aspects of cognitive ability decline as we age, functioning is preserved in many contexts, and there are areas that actually improve as one get older, because it is quite evident that most people over the age of 65 are functioning on their own, living on their own and doing quite well. So wisdom may be the ability which helps in coping in the situation where cognitive functioning is declining (Riabinin, 2007).

Cognitive failure translated into memory failure can lead to a host of practical and social problems for the elderly like - inability to handle the demands of daily work life, maintaining social contacts, relating with the more competent younger generation etc. Thereby one of the major aspects associated with cognitive failure appears to be depression especially in old age. The relationship between depression and cognitive functioning in old age appears to be quite complex and it does not seem too clear whether cognitive failure accompanies depression or is followed by it; hence an enquiry into this issue appears to be required. According to Gow, et al. (2005) "Cognitive vitality is essential to quality of life . . . in old age." They examined the possibility that cognitive factors may be associated with people being happier. They propose that lack of a cognition-life satisfaction relation could be due to the fact that higher ability is equally likely to lead to positive (increasing one's resources through entry to better employment, for example), as well as negative outcomes (an awareness of alternative lifestyles or a striving for greater achievement), which may be used when judging subjective wellbeing. In promoting successful ageing it is necessary to know not only what protects cognition but also what predicts happiness.

Depression

Older studies, based largely on institutionalized samples, show an increase in negative mood and decrease in positive mood with age

(Malatesta, 1981). However Rothermund and Brandtstädter (2003) did not find a consistent picture in a combined cross-sectional and 8-year longitudinal study on 690 participants, aged 54-77 years. They suggest two developmental phases: Relative stability extending to about 70 years and a subsequent increase of depressive tendencies. Differences in time perspective and a disposition of accommodative flexibility predicted subsequent changes in depression and mediated age effects in depressive tendencies. Teachman (2006) found a curvilinear relationship for depressive symptoms with mean symptom levels increasing during early adulthood (until the mid-30s) and then showing a small decline until older adulthood (the mid-70s), when symptoms again increase with age in a cross-sectional study (N = 335, age 18 to 93) .

Studies dealing with stress point to the possible linkage between depression and cognitive decline. Vinkers, Gussekloo, Stek, Westendorp, et al. (2004) in a longitudinal study (N=500, age 85 to 89yrs) found that, at age 85 years, depressive symptoms and cognitive impairment were highly and significantly correlated. They concluded that Caregivers should be aware of the development of depressive symptoms when cognitive impairment is present. Neupert, Almeida, Mroczek and Spiro III (2006) indicated that on days when older adults (n=333) experienced stressors, particularly interpersonal stressors, they were more likely to report memory failures. The findings may be important for planning preventions to mitigate age-related cognitive decline. Stawski, Sliwinski and Smyth (2006) argued that studies of aging have shown that distress is associated with lower cognitive performance, but none have examined the effects of cognitive interference. Their results suggest that cognitive process related to stress is an important predictor of cognitive function in advanced age. Barclay (2008) found among a combined sample of men and women (N=1256), a distress-prone person was about 40% more likely to develop Mild Cognitive Impairment (MCI) than someone not prone to distress and association of distress proneness with risk for MCI was stronger in men than in women. They concluded that among older persons without manifest cognitive impairment, higher level of chronic psychological distress is associated with increased incidence of mild cognitive impairment. Similar findings were reported by Barnes, Alexopoulos, Lopez, Williamson, Yaffe (2006).

Loneliness and Role of Social Interaction

Social isolation and loneliness are one of the most common problems experienced by older people. This may happen either as a result of living alone, a lack of close family ties, reduced connections with their culture of origin, or an inability (often through lack of transport or monetary resources) to actively participate in the local community. Loneliness resulting under these circumstances can have serious consequences for a person of any age but more so for the elderly.

It may be expected that wise people would be better in interpersonal skills so their social relationships could be more satisfying and successful. Bill von Hippel (2008) examined the link between people's age and their social satisfaction and found that despite the fact that older people engage in fewer social activities with others and spend more time alone, they are just as socially satisfied as their younger counterparts. The finding suggests that having similar experiences with younger person's older adults are likely to find it more uplifting. Dolcos (2008) while studying the brain function for emotional development and he concluded that emotional control improves with aging. Older adults are less prone to recognize negativity in any stimuli, they have a positivity bias toward things. It appears that older people see the good things in the life more easily and are less likely to be upset by the little things that go wrong. As a consequence, their daily experiences bring them just as much satisfaction as to younger adults, even if they lose their friend or spouse, or if they can no longer get out as much as, they would like to. According to Dolcos (2008) "This is the wisdom of aging".

Losses in old age, symbolic or real, are the psychological basis of many depressions. Jylha (2004) in a study on people aged 60 and over showed that loneliness does increase with age, not because of age per se, but because of increasing disability and decreasing social integration. Dykstra, van Tilburg, & de Jong (2005) in their study found that older adults generally become lonelier as time passes. Older adults who lose their partner by death show the greatest increase in loneliness. Improvement in functional capacity and network expansion lend to less loneliness. Paul, Ayis and Abraham (2006) conducted a cross-sectional study on 999 people and concluded that feeling of loneliness is the single most important predictor of psychological distress, and not knowing neighbors increases the probability of depression. Cacioppo, Hughes,

Waite, Hawkey and Thisted (2006) conducted two population based studies and concluded that higher levels of loneliness were associated with more depressive symptoms. Barg, Ashmore, Wittink, Murray, Bogner, and Gallo (2006) reported that older adults viewed loneliness as a precursor to depression, as self-imposed withdrawal, or as an expectation of aging. It appears that loneliness may contribute to depression in the aged but it may also lead to lowered levels of cognitive stimulation and thereby may result in cognitive decline or cognitive failure.

It seems that a complex relationship exists between wisdom, cognitive failure, depression and loneliness which need to be explored further through empirical investigations.

Objectives

The present study was, hence, conducted with the following objectives –

1. To explore the age related changes in wisdom, cognitive failure, depression, and loneliness among older men.
2. To explore the relationship of wisdom with the cognitive failure, loneliness and depression among older men.

Hypotheses

Following hypotheses were formulated in the light of above literature review.

1. There will be no age related differences on wisdom.
2. Men belonging to higher age group (65+ yrs) are expected to score higher on cognitive failure, depression, and loneliness as compared to those belonging to lower age group (60-64 yrs).
3. Wisdom is expected to be negatively related to cognitive failure, depression, and feeling of loneliness for both age groups.
4. Cognitive failure, depression and loneliness are expected to be positively correlated for both age groups.

Method

The present study was conducted on a sample of 50 older men divided into two groups, on the basis of age, 60-64 yrs (N=25) and 65+

yrs (N=25) from Varanasi city (U.P.) belonging to middle socioeconomic status and educated up to graduate level.

Three Dimensional Wisdom Scale developed by Ardelt (2003) which consists of three components of wisdom viz., cognitive (W-Cognitive), reflective (W-Reflective), and affective (W-Affective) with respectively 13, 14 and 12 items for each dimension, was used for assessing wisdom. Indian adaptation of Cognitive Failure Scale (Dwivedi & Mishra, 1993) was used to assess everyday cognitive failures related to memory. Geriatric Depression Scale (Ganguli, et al., 1999) and UCLA loneliness scale (Russell, 1996) were used to assess the presence of depression and feeling of loneliness respectively. An interview schedule was also administered to obtain information related to demographic data, perception of old age, level of social interaction etc.

The tests were individually administered to each subject after explaining the purpose of the study and obtaining their consent to participate in the study.

Results

Mean and S.D.'s were computed and t-test was applied to compare the subjects belonging to two age groups 60-64 yrs and 65+ yrs on wisdom, depression, loneliness and cognitive failure. Correlation analysis was performed to assess relationship of the three dimensions of wisdom with cognitive failure, feeling of loneliness and depression within each age group. Furthermore, subjects were divided into high and low wisdom groups on the basis of median of overall wisdom scores and compared using t-test on the cognitive failure, loneliness and depression. Responses of high and low wisdom group related to perception of old age and level of social interaction were analyzed using chi-square test.

Results Related To Comparison of Age Groups

None of the t-values indicating age related differences between 60-64 yrs and 65+ yrs groups on W-Cog, W-Ref, W-Aff, W-Total, cognitive failure, loneliness or depression were found to be significant. Thus, subjects belonging to 60-64yrs age group and 65+ yrs age group were found to be similar on dimensions of wisdom- W-Cog, W-Ref, W-Aff, W-Total, cognitive failure, depression and loneliness and none of the variables indicated age related changes.

Table 1. Mean, S.D. and t-Values indicating Age Related Differences on Wisdom, Cognitive Failure, Depression and Loneliness

Variables		60-64 Yrs (N=25)	65 + yrs (N=25)	t-Value
W-Cognitive	M	42.32	41.88	.26
	S.D.	(5.66)	(6.31)	
W-Reflective	M	39.52	39.083	.27
	S.D.	(4.73)	(6.84)	
W-Affective	M	40.04	42.08	.33
	S.D.	(4.34)	(6.31)	
W -Total	M	121.88	123.04	.30
	S.D.	(10.30)	(16.24)	
Cognitive Failure	M	41.52	38.12	.87
	S.D.	(13.98)	(12.94)	
Depression	M	9.56	8.08	.72
	S.D.	(5.54)	(5.52)	
Loneliness	M	22.08	22.40	.11
	S.D.	(9.16)	(7.48)	

Results related to Correlational Analysis

W-Cognitive was significantly and negatively correlated with cognitive failure in 65+ yrs age group ($r_{23} = -.43, p < .05$) and with feeling of loneliness in 60-64 yrs age group ($r_{23} = -.42, p < .05$). W-Reflective was negatively correlated with cognitive failure ($r_{23} = -.47, p < .05$) and depression ($r_{23} = -.55, p < .01$) only within 65+ yrs age group and with feeling of loneliness for 60-64yrs ($r_{23} = -.48, p < .05$) as well as for 65+yrs group ($r_{23} = -.70, p < .01$). W-Affective was uncorrelated with cognitive failure or depression but was negatively correlated only with feeling of loneliness ($r_{23} = -.51, p < .01$) for 65+yrs age group only. Depression was uncorrelated with cognitive failure but was positively correlated with feeling of loneliness in 65+ yrs age group only ($r_{23} = .63, p < .01$). Feeling of loneliness was significantly and positively correlated with cognitive failure for 60-64 yrs group ($r_{23} = .61, p < .01$) as well as for the 65+ yrs group ($r_{23} = .57, p < .01$) in both age groups (Table 2).

Table 2. Correlations between Wisdom, Cognitive Failure, Depression and Loneliness Scores by Age Groups.

AGE GROUPS VARIABLES	Cognitive Failure			Depression			Loneliness		
	60-64 Yrs	65+ Yrs	Total Group	60-64 Yrs	65+ Yrs	Total Group	60-64 Yrs	65+ Yrs	Total Group
W-Cognitive	-0.19	-0.43*	-0.31*	0.06	-0.18	-0.06	-0.42*	-0.32	-0.37**
W-Reflective	-0.27	0.54**	0.40**	-0.24	-0.55**	-0.41**	-0.48*	-0.70**	-0.57**
W-Affective	-0.16	-0.37	-0.29*	-0.11	-0.31	-0.25	-0.20	-0.51**	-0.38*
W-Total	-0.30	0.54**	0.41**	-0.12	-0.43*	-0.30*	-0.54*	-0.62**	-0.55**
Depression	0.08	0.31	0.20				0.12	0.63**	0.34*
Loneliness	0.61**	0.57**	0.59**						

** Significant at the 0.01 level (2-tailed).

* Significant at the 0.05 level (2-tailed).

Results related to Comparison of High and Low Wisdom Ss

Since none of the age related differences were significant, hence, for further analysis subjects belonging to both age groups were combined and on the basis of median of W-Total scores, they were divided into high (Wis-High) and low (Wis-Low) groups and further compared on cognitive failure, depression and loneliness. Analysis suggests that significant difference existed between Wis-High and Wis-Low group on cognitive failure ($t=3.09$, $p<.01$) and loneliness ($t=4.02$, $p<.01$) but not on depression. Wis-Low Ss scored significantly higher on cognitive failure (44.82), and loneliness (26.04) as compared to Wis-High Ss who scored 33.09 and 17.78 respectively on these variables. Wis-High subjects had lower scores (7.61) on depression than Wis-Low (9.85) subjects but the difference was not significant (Table 3).

Responses of Wis-High and Wis-Low group on items related to demographic data and perception of old age indicated that even though values of contingency coefficients were not significant, a higher percentage of Wis-High Ss reported that they lived in joint families (73.9%), live with more number of people (65.2%) and had more than four dependents (52.2%), and felt that old age begins only after 60 years (73.9%) (Table 4).

Table 3: Mean, S.D. and t-values indicating differences between High and Low Wisdom level Subjects on Cognitive Failure, Depression and Loneliness

	Groups by Level of Wisdom			t-Value
		Wis-Low (N=27)	Wis-High (N=23)	
Cognitive Failure	M	44.82	33.96	3.09**
	S.D.	(14.21)	(9.85)	
Depression	M	9.85	7.61	1.45
	S.D.	(5.13)	(5.83)	
Loneliness	M	26.04	17.78	4.02**
	S.D.	(8.50)	(5.36)	

Table 4: Responses of High and Low Wisdom Subjects on Demographic Data & Perception of Old Age

		Group by Level of Wisdom		Contingency Coefficient
		Wis-Low (N=27)	Wis-High (N=23)	
Educational Status	Graduate	12 (44.4%)	11 (47.8%)	.03
	PG & above	15 (55.6%)	12 (52.2%)	
Family Status	Nuclear family	12 (44.4%)	6 (26.1%)	.19
	Joint family	15 (55.6%)	17 (73.9%)	
Family Size	Small (2-5)	15 (55.6%)	9 (39.1%)	.20
	Large (5+)	12 (44.4%)	15 (65.2%)	
Financial Status	Dependent	8 (29.6%)	6 (26.1%)	.04
	Independent	19 (70.4%)	17 (73.9%)	
No. of Dependents	0-3	17 (68.0%)	11 (47.8%)	.24
	4 & above	8 (29.6%)	12 (52.2%)	
Onset of Old Age	50	9 (33.3%)	6 (26.1%)	.80
	Above 60	18 (66.7%)	17 (73.9%)	
Respect to Older People	No	11 (40.7%)	9 (39.1%)	.02
	Yes	16 (59.3%)	14 (60.9%)	

Responses of Wis-High and Wis-Low group on items related to problems faced by older people indicate that larger percentage of Wis-Low subjects felt that loss of health (77.8%), loss of memory (63%), are major problems of old age. Significantly higher percentage of Wis-Low subjects felt that they are facing either none (29.6%) or only one (29.6%) problem whereas a significantly larger number of Wis-High subjects felt that they were facing a large number of problems (47.8%) (Table 5).

Table 5: Responses of High and Low Wisdom Subjects on Perceived Problems of Old Age

Perceived Problems	Response	Group by Level of Wisdom		Contingency Coefficient
		Wis-Low (N=27)	Wis-High (N=23)	
Self Age Perception	Middle age	23 (85.2%)	20 (87.0%)	.02
	Old or very old	4 (14.8%)	3 (13.0%)	
Loss of Health	No	6 (22.2%)	7 (30.4%)	.09
	Yes	21 (77.8%)	16 (69.6%)	
Lack of Money	No	14 (51.9%)	11 (47.8%)	.04
	Yes	13 (48.1%)	12 (52.2%)	
Loss of Memory	No	10 (37.0%)	12 (52.2%)	.15
	Yes	17 (63.0%)	11 (47.8%)	
Lowered Status	No	18 (66.7%)	14 (60.9%)	.06
	Yes	9 (33.3%)	9 (39.1%)	
Feeling Useless	No	14 (51.9%)	16 (69.6%)	.17
	Yes	13 (48.1%)	7 (30.4%)	
Facing New Situations	No	14 (51.9%)	11 (47.8%)	.04
	Yes	13 (48.1%)	12 (52.2%)	
No. of Problems Being Faced	None	8 (29.6%)	2 (8.7%)	.37*
	One	8 (29.6%)	4 (17.4%)	
	More than one	10 (37.0%)	11 (47.8%)	
	All	1 (3.7%)	6 (26.1%)	

Table 6: Responses of High and Low Wisdom Subjects on Social Interaction

Type of Social Interaction	Response	Group by Level of Wisdom		Contingency Coefficient
		Wis-Low (N=27)	Wis-High (N=23)	
Like Talking to Neighbors	No	6 (22.2%)	2 (8.7%)	.18
	Yes	21 (77.8%)	21 (91.3%)	
Ability to Remember Names of Friends & Relatives	No	4 (14.8%)	2 (8.7%)	.09
	Yes	23 (85.2%)	21 (91.3%)	
Participation in Social Activities	No	9 (33.3%)	7 (30.4%)	.03
	Yes	18 (66.7%)	16 (69.6%)	
Membership of Social Group	No	15 (55.6%)	12 (52.2%)	.03
	Yes	12 (44.4%)	11 (47.8%)	
No. of Reliable Contacts	Few	19 (86.4%)	13 (56.5%)	.31*
	Many	3 (13.6%)	10 (43.5%)	
Frequency of Meeting with Children	Infrequent	7 (43.8%)	5 (31.3%)	.25
	Frequent	9 (56.3%)	11 (68.8%)	
Frequency of Talking to Children on Phone	Infrequent	6 (40.0%)	6 (35.3%)	.19
	Frequent	9 (60.0%)	11 (64.7%)	
Phone Calls Initiated by	Myself	4 (30.8%)	3 (21.4%)	.11
	Both	9 (69.2%)	11 (78.6%)	
No. of Close Relatives apart from Children	One or Lesser	4 (16.7%)	5 (22.7%)	.38*
	More than one	17 (70.8%)	7 (31.8%)	
	Many	3 (12.5%)	10 (45.5%)	
Frequency of Meeting with Close Relatives	Infrequent	13 (54.2%)	6 (27.3%)	.26
	Frequent	11 (45.8%)	16 (72.7%)	

Analysis of responses on items related to level of social interaction indicate that significantly larger percentage of Wis-High subjects report having a high number of reliable contacts ($C=.31$, $p<.05$), and maintain interaction with close relatives apart from children ($C=.38$, $p<.05$). On some other items the contingency coefficients were not significant but the responses warrant attention. A higher percentage of Wis-High Ss reported that they participated in social activities (69.6%), maintain frequent and active contact with their children by either meeting them (68.8%) or talking on phone (64.7%), not only calling but also being called by them on phone (78.6%) and having frequent contact with close relatives (72.7) than Wis-Low Ss ((Table 6).

Discussion

A cursory view of results suggests that, wisdom appears to remain stable over the age span from 60 to about 75 yrs as no age related changes were obtained on any of the three dimensions of wisdom, viz. cognitive, reflective and affective. The results support the conclusions drawn by Birren and Fisher (1990) and Pasupathi, Staudinger and Baltes (2001). According to these studies wisdom develops till certain age then it levels off. Furthermore age related changes have also not been observed with respect to cognitive failure, depression, and loneliness. Both the age groups are similar on these aspects also suggesting that age may not be a determining factor in context to cognitive failure, depression, and loneliness also. The prevalent stereotypical view that old age as a period of declines needs to be reevaluated and more effort needs to be expended on understanding individual aging process. Possibly an idiographic approach as against the commonly used nomothetic approach is more suitable in context to understand the process of aging and the problems of elderly.

Results of the present study also suggest that older people with high level of wisdom are more likely to retain their cognitive functioning, be less depressed and suffer less from feeling of loneliness. This seems to be truer in case of the older subjects aging 65 years or above as compared to the younger subjects in the age range of 60-64 yrs. The role of wisdom thus seems to become much more significant at a later age than at an earlier age. Reflective aspect of wisdom seems to be much more strongly and negatively associated with cognitive failure,

depression and loneliness. Reflective wisdom is considered to be the prerequisite for the development of cognitive and affective dimension of wisdom and relates to the ability to perceive reality without any major distortion. It involves looking at phenomena and events from many different perspectives and leads to development of self awareness and self-insight which is expected to gradually reduce one's self-centeredness, subjectivity and increase one's insight into the true nature of things, including the motivations of one's own and other people's behavior. Though correlation can not be used to conclude causation but it may be quite safe to argue that high level of reflective wisdom may probably be playing a crucial role reducing a sense of depression and loneliness among the older subjects. The affective dimension of wisdom, which relates to the presence of positive emotions, behavior toward other beings and the absence of indifferent or negative emotions and behavior toward others, also appears to be related negatively with feeling of loneliness. Probably this is what Docolos (2008) referred to as 'the wisdom of aging' when he concluded on the basis of his study that older people see the good things in the life more easily and are less likely to be upset by the little things that go wrong. As a consequence, their daily experiences bring them just as much satisfaction as to younger adults, even if they lose their friend or spouse, or if they can no longer get out as much as, they would like to.

The results also convey that level of social interaction may have a role to play in this scenario and this relationship of wisdom, cognitive failure, depression, and feeling of loneliness needs to be evaluated in context to the actual opportunities available to the older person for social interaction. Subjects who were higher on wisdom more often lived in joint families, had larger number of family members living in the same house, had more dependents, had high number of reliable contacts, maintain interaction with close relatives other than their children, participated in social activities, maintain frequent and active contact with their children by either meeting them or talking on phone, not only calling but also being called by them on phone, and having frequent contact with close relatives. The life circumstance which gives a person a chance to interact with more number of people appear to probably help to promote development of wisdom, act as buffer for cognitive decline and protect the older persons from being depressed and reduce

the feeling of loneliness. Social interaction may work in various ways to enhance positive outcomes for older people by providing opportunities for cognitive stimulation, enhance self esteem due to perception of acceptance by not only their own children but also by distant relatives, a sense of being socially active and useful. It may also make it possible for the older person to receive all kinds of social support from different sources due to the fact that he would be surrounded by a larger number of persons.

In conclusion it may be stated that the relationship between wisdom, cognitive failure, depression and loneliness needs to be further investigated on a larger sample and the role of social interaction also needs to be given due attention in order to plan target behaviors and social situations for geriatric counseling and formulate policies for older people that may lead to betterment of their lives in general.

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Living Arrangements Preferences of Elderly: Evidence from Field Study in Orissa

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ABSTRACT

Studies on living arrangement generally presumed that there is a convergence between preferred place of stay and the actual one in any society. However, very little information is available on the preferences in living arrangements among the elderly, especially in the Indian context. Hence in this study the different aspects of preference in living arrangement among the elderly in Orissa attempted afresh. A sample size of 300 elderly persons with 150 from the rural and 150 from the urban Orissa was drawn for this study. The information was collected through a household survey. The major objective of this paper was to study the living arrangement preferences of the elderly and its determinants in Orissa. It is generally observed that although co-residence is the most preferred living arrangement, preference to living alone was also high among certain sub sections of the elderly. Bivariate analysis shows that demographic characteristics like age, sex and number of surviving sons affect significantly on living arrangement preferences among elderly in Orissa. Similarly, education of the elderly and their economic independence are also strongly correlated with the preference to live alone. The data on the deviation from the actual and preferred place of stay indicate that nearly 23 percent of the elderly are not staying in their preferred place of stay. This study brings out some of the important findings, which will helpful for planners to prepare suitable policy for elderly population.

Key words: Elderly, Living arrangements, Preference, Demographic, Socio-economic status, Orissa.

The issue of elderly especially in the context of India is surprising to be studied. Nobody thought the issues of elderly relating to their health, morbidity pattern, diseases pattern, isolation, adjustment within the family, abused, insecurity, and living arrangements before 20th century. Though there are some studies, which looked into the elderly health in India, still the research area is very young. As the traditional culture in India, educated all of us that the elderly should be respected in the society and treated as head of the family with all dignity and pride because of their vast wisdom and past experience. So the living arrangements of elderly was never be an issue before two decades ago and it is assumed that the family have all the responsibility for the care and treatment of the elderly with all the aspect in which the elderly should live with full dignity and supremacy. In reverse, in the traditional society elderly have the command over the younger generation and guider for the right path for their successor. However there are lot of changes taken place in the present society. Especially getting a proper living arrangement is challenge for elderly in India. There are lots of evidence on the issues of elderly such as elderly abused within the family by their children, elderly separation from their family and so many. All these issues brings out the concepts of living alone among elderly, old age homes, day care centres, mobile health care, old age pension, security and lot many. There are lots of studies concludes that the living alone among elderly and living in old age homes is increasing because of multi dimensional factors. With this scenario it is of great interest to study the preference in living arrangements among elderly with the evidence from a field study in Orissa.

Studies on living arrangement generally presumed that there is a convergence between preferred place of stay and the actual one in any society. But there are several constraints exist in exercising the choice of stay for the elderly. Preference is defined as the real or imagined choice among the alternatives based on happiness, satisfaction, gratification, enjoyment and utility they provide (Sen, 1982). More generally, it can be seen as a source of motivation. The individual choice in any society is the central point to estimate the individual preference. The emphasis on the individual and his or her interests is always a starting point for any theory of preference.

However, very little information is available on the preferences in living arrangements among the elderly, especially in the Indian context. Hence in this study the different aspects of preference in living arrangement among the elderly in Orissa attempted afresh.

Objectives of the Study

The major objectives of this paper are as follows:

1. To study the living arrangement preferences of the elderly in Orissa.
2. To study the determinants of living arrangement preferences of the elderly in Orissa.
3. To examine the extent of deviation in actual and preferred living arrangements of elderly in Orissa.

Method

Sample :

Purposive multi stage sampling design is used for the selection of the study area. Selection of district is the first stage-sampling unit followed by selection of village in rural residence and colony in the urban residence is the second stage-sampling unit for the data collection. Selection of household is the third stage-sampling unit for the data collection. On the basis of level of urbanization Khordha district in Orissa is selected as the first stage-sampling unit. On the basis of low literacy rate one village is selected in rural residence in the Khordha district. Similarly on the basis of highest literacy rate one ward is selected in Bhubaneswar (Khordha district) city for the study of urban sample. Census 2001 data is used for the information about the literacy rate, number of households in the village and total population of the study area. Only those households are having elderly (60+) population are considered for the interview in the study.

Data collection and Analysis

The primary data for this study were collected from the rural and urban areas of Orissa. A sample size of 300 elderly persons with 150 from the rural and 150 from the urban areas was drawn for this study. The information was collected through a household survey. The analysis is based only on the data from the household survey of the 300 elderly members.

For studying preference in living arrangements of the elderly and its deviation an attempt was made to link the association with the background characteristics of the elderly such as demographic, socio economic characteristics through cross tabulation and chi-square test statistics. SPSS package is used for the data analysis.

Findings :

Living Arrangement Preferences in Orissa

Before discussing the data on preferences in living arrangements an attempt was made to look into the pattern of actual living arrangement. The table 1 shows that the actual living arrangement pattern observed in this study area is more or less similar to that of the results that were observed from the national sample survey conducted by National Sample Survey Organization (NSSO), Government of India in 2004 (60th round, survey on Morbidity, Health Care and Conditions of the aged; NSS, 2006). The general pattern that was observed in the study area is that 15 per cent of the elderly live alone (defined as either living alone or with the spouse) and the remaining 85 per cent are co-residing. Among those who co-reside, 59 per cent live with spouse and other members, 24 per cent live without spouse but with children and

Table 1 : Percentage distribution of actual living arrangements among elderly in Orissa by place of residence.

Actual Living Arrangements	(Based on the Primary Data)			Based on the NSSO 60 th round data		
	Rural (%) (N=150)	Urban (%) (N=150)	Total(%) N=300	Rural (%) (N=150)	Urban (%) (N=150)	Total(%) N=1238
Living alone / with spouse	16.7	13.3	15.0	15.6	14.5	15.5
With spouse & children	58.7	60.0	59.3	50.8	55.7	51.2
Without spouse & children	22.7	25.3	24.0	31.1	27.3	30.7
Others	2.0	1.3	1.7	2.6	2.5	2.6
Total	100	100	100	100	100	100

Source : Author's calculation

nearly 2 per cent live with others. The proportions of those are living alone are relatively higher in rural areas than in urban areas. These results clearly show that the majority of the elderly in Orissa are living in co-residence and 15 per cent of the elderly are living alone.

The next step is to see what are the living arrangement preferences among the elderly and how far the preferred living arrangements differ from that of the actual one.

Table 1A presents the living arrangement preferences of the elderly in Orissa. The living arrangement pattern has been classified into, living alone, living with spouse and children, living with married sons and living with married daughters. This table shows that majority of the elderly prefer to be in co-residence, whereas only 2.3 percent of the elderly prefer to live alone. Nearly three fourth of the elderly with co-residence, prefer to live with spouse and children, and a little more than one fifth preferred to live with their married sons and two percent of the elderly preferred to live with married daughters. This table also shows the urban-rural differentials in elder's preferences in their living arrangements. Clearly, the proportion of urban elderly who prefer to live alone (3.3 percent) is higher as compared to their rural counterpart (1.3 percent). Similarly, preference of the elderly to live with the married daughters is also higher in urban areas than observed in the rural areas.

Table 1A : Percentage distribution of preferred living arrangements among elderly in Orissa with place of residence.

Preferred living arrangements	Place of residence***		Total (%) (N=300)
	Rural (%) (N=150)	Urban (%) (N=150)	
Living alone	1.3	3.3	2.3
With spouse & children	70	78	74
Married sons	27.3	16	21.7
Married daughters	1.3	2.7	2

*Chi-square test is significant at < 0.10***

(Number of observations are in the parenthesis)

Source: Author's calculation

It is perhaps quite true that Indian elderly are traditionally taken care of by the family and this accepted norm is also shown in their preferences as majority still prefer to live with their family rather than to stay alone. However, there is an indication that the preference to live alone is slightly higher in the urban areas indicating that the chances of the elderly opting to live alone in future are higher.

It is interesting to note that almost all the elderly who preferred to live alone did so mainly because of the need for privacy or independence (Table 2). However, the preference for co-residence was mainly determined by the economic dependency. More than half (54.30%) of the elderly indicated that they prefer to be in co-residence mainly because they are economically dependent on others for their day-to-day life. The other important reasons for preferring co-residence were the need for physical care and emotional support (23.70%), followed by traditional and cultural value system (19.3 %).

Table 2 : Reasons of Preferring Particular Living Arrangements among Elderly in Orissa.

Reasons	Preferred living arrangements*				Total (%)
	Living alone (%)	With spouse & children (%)	Married sons (%)	Married daughters (%)	
Privacy or independence	100	0.9	0	0	2.7
Economically dependent on others	0	56.3	55.4	33.3	54.3
Physical needs and emotional support	0	23.9	24.6	33.3	23.7
Cultural values	0	18.9	20.0	33.3	19.3
Total	100 (7)	100 (222)	100 (65)	100 (6)	100 (300)

* Chi-square test is significant at $< 0.01^*$

(Number of observations are in the parenthesis)

Source: Author's calculation

The reasons for preferring a particular living arrangement varies across their place of residence as majority of the rural elderly (73.30%) cited economic dependence as the reason for preferring a particular living arrangement, whereas in urban areas, need for physical care and emotional support were the major reason (37.3 percent) cited. Similarly, majority of the males (41.10%) and females (66.70%) cited economic dependence as the major reason for a particular preference. A higher proportion of males (30.80%) than females (16.80%) have reported need for physical care and emotional support as the reason for preferring a particular living arrangement.

Table 3 : Reasons of preferred living arrangements by place of residence and sex of the respondents in Orissa.

Reasons of preferred living arrangements	Place of residence*		Sex of the respondent*		Total (N=300)
	Rural (%) (N=150)	Urban (%) (N=150)	Male (%) (N=146)	Female (%) (N=154)	
Privacy or independence	0.7	4.7	2.7	2.6	2.7
Economically depends on others	73.3	35.3	41.1	66.9	54.3
Needs physical care and emotional support	10.0	37.3	30.8	16.8	23.7
Cultural values	16.0	22.7	25.3	13.6	19.3
Total	100	100	100	100	100

* Chi-square test is significant at $< 0.01^*$

(Number of observations are in the parenthesis)

Source: Author's calculation

Although majority of the elderly prefer co-residence, it will be of interest to see how the preference differs across various demographic and socio-economic characteristics. An attempt has been made in the following section to see whether the living arrangement preferences vary with the demographic and socio economic characteristics of the elderly.

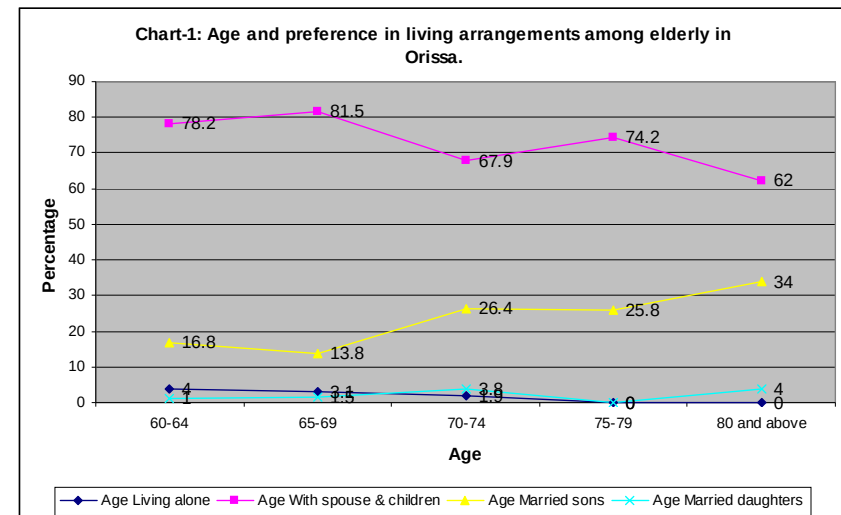
Demographic Differentials in Living Arrangement Preferences

Although studies on living arrangement preferences in India are very few, studies carried out elsewhere have shown that, living arrangement preferences may vary according to socio-economic and demographic characteristics of the elderly (Chan and Davanzo, 1996; Domingo and Asis, 1995; Elman and Uhlenberg, 1995; Kim and Rhee, 1997). Studies from both developed and developing countries have indicated that the living arrangement preferences among the elderly vary with age, gender, marital status and number of surviving children. Gender differentials in living arrangement preferences have been noted by many researchers, both from developed and developing countries (Rudkin, 1993; Shah *et al.*, 2002). In general, studies have shown that, a higher proportion of females prefer to live alone whereas a higher proportion of males prefer to live in co-residence. However, mixed results were found in the studies conducted in developing countries. Very few studies have shown that elderly female in developing countries prefer to live in co-residence, whereas elderly males preference is to live alone (Zimmer and Kim, 2001), and a few other studies show contrary findings as more female elderly prefer to live alone whereas male elderly prefer to live in co-residence. The reason for this was mainly because the majority of the male elderly are not involved in household work like cooking, cleaning etc and therefore they are not able to maintain their house without others help (Zimmer and Kim, 2001).

While much of the information on the preference of the elderly with respect to their living arrangement are not available in the Indian context, it will still be of great interest to explore into the preference variations with respect to various demographic characteristics of the elderly.

Chart 1 provides the age-wise variations in living arrangement preferences among the elderly in Orissa. This graph clearly indicates that the preference to live alone is inversely related to their age. Higher the age of the elderly, the lower is their preference to live alone. A relatively higher proportion of elderly (4%) in the age group 60-64 preferred to live alone as compared to the elderly in the age group 65-69 (3.10%) and in 70-74 (1.90%), while none of the elderly age 75 or above preferred to live alone. If one looks at the cohort effect, it can

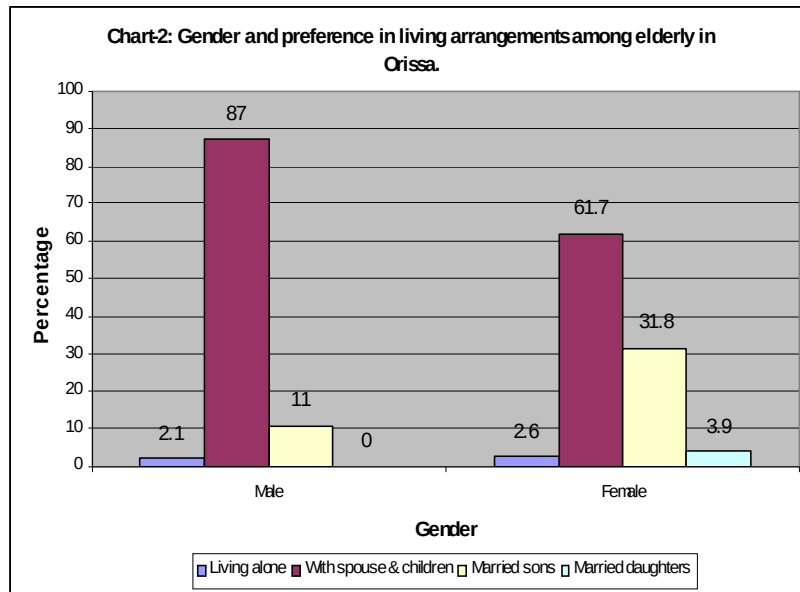
be seen that a higher proportion of elderly belonging to younger cohort preferred to live alone than elderly belonging to older cohorts. These indicate that the preference to live alone is higher among the elderly who are relatively younger and that the preference to live alone is likely to go up in the future, as a higher proportion of the younger olds prefer to live alone compared to the older olds.



Preference in co-residence and age shows that, irrespective of the age, a majority of the elderly prefer to be in co-residence. However, a higher proportion of elderly who are above 70 years preferred to stay with their married sons than those who are in the age group 60-69 years. Similarly, preference of staying with married daughter also increases with increase in age. All these findings could suggest the recent changes in the existing value systems in the society where younger cohort prefers not to stay with the married sons.

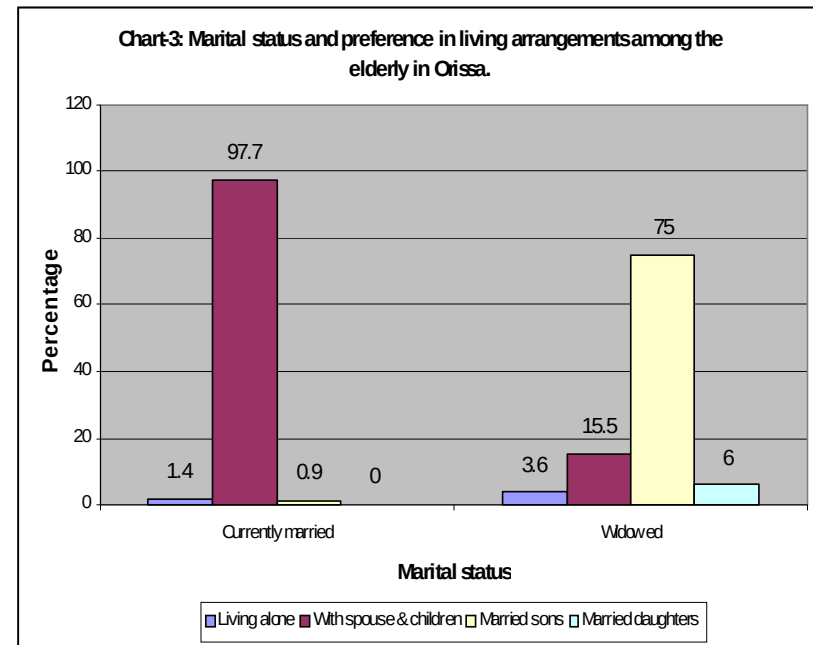
Chart 2 shows the gender differentials in living arrangement preferences. Irrespective of the gender, majority of the elderly in Orissa prefer to live in co-residence. Within co-residence, male female differentials do exist in living arrangement preferences. A higher proportion of male elderly (87 %) preferred to live with spouse and children whereas only 62 percent of the elderly female preferred to live with spouse and children. A higher proportion of female elderly

(32%) preferred to stay with their married sons whereas only a few male elderly (11%) preferred this living arrangement. Surprisingly, none of the male elderly showed their preference to live with their married daughters whereas nearly 4 percent of the female elderly preferred to stay with their married daughters. The proportion of elderly who preferred to live alone was also slightly higher among females (2.60%) than among males (2.1%).



Like gender differentials, differentials by marital status are also seen in living arrangement preferences. Only one percent of the currently married elderly preferred to live alone whereas this proportion is nearly four times higher (3.6%) in case of widowed elderly (chart 3). Preference to stay with married sons and daughters is also much higher among widowed elderly compared to elderly who are currently married.

It is well established that, India is a traditional society and children are expected to take care of the elderly parents during their old age. Therefore the number of surviving children and their sex composition could be an important variable that determine the living arrangement preferences. Table 4 presents the data on number of surviving children



and the living arrangement preferences. This table clearly establishes the linkages between number of surviving children and the living arrangement preference of the elderly in Orissa. The preference for living alone was highest among the elderly who did not have a child (16.70%). The proportion of elderly who preferred to live alone is inversely proportional to the number of surviving children they had. Only 4.4 percent of the elderly with one child preferred to live alone whereas this proportion decreased to 2.5 and 1.2 among elderly with 2 and more than 2 surviving children respectively.

Not only the number of surviving children but their sex composition is also important determinant of the living arrangement preferences. The proportion of the elderly who preferred to live alone is 15.8 percent among the elderly who has no sons whereas this proportion is only 2 percent among the elderly with no daughters. This indirectly establishes the importance of sons in living arrangement preferences. It may be quite possible that in Orissa, like in India, sons are the major caregivers for parents in their old age. It is traditionally the sons who look after the parent during their old age and not the daughters and this must

Table 4: Bi-variate Distribution of Number of Children and Preferred Living Arrangements of Elderly Persons in Orissa.

Variables	Preferred living arrangements (%)				Total
	Living alone	With spouse & children	Married sons	Married daughters	
Number of surviving children*					
No child	16.7	50.0	33.3	0	100 (6)
One child	4.4	60.0	26.7	8.9	100 (45)
Two children	2.5	72.2	25.3	0	100 (79)
More than 2 children	1.2	79.4	18.2	1.2	100 (170)
Number of surviving sons*					
No son	15.8	47.4	10.5	26.3	100 (19)
One son	1.8	75.5	21.8	0.9	100 (110)
Two sons	0.9	76.8	22.3	0	100 (112)
More than 2 sons	1.7	74.6	23.7	0	100 (59)
Number of surviving daughters***					
No daughter	2.2	72.4	25.4	0	100 (134)
One	3.8	68.4	22.8	5.1	100 (79)
Two	2.0	82.4	15.7	0	100 (51)
More than 2	0	80.6	13.9	5.6	100 (36)
Total	2.3 (7)	74.0 (222)	21.7 (65)	2.0 (6)	100 (300)

* Chi-square test is significant at $< 0.01^*$ & $< 0.10^{***}$

(Number of observations are in the parenthesis)

Source: Author's calculation

have been the reason for a higher proportion of elderly with no sons preferring to live alone. It is also interesting to note that nearly 26 percent of the elderly with no sons preferred to live with their daughters.

In general the demographic differentials in living arrangement preferences indicate that irrespective of the demographic characteristics, a majority of the elderly in Orissa prefer to be in co-residence. Data on living alone show a higher proportion of younger olds, females, and elderly with no sons preferring to live alone as compared to their counterparts.

Socio Cultural factors and Living Arrangement Preferences

Care of the elderly has always been the responsibility of the family in most of the Asian countries including India. However, with the rising modernization, the joint family system is breaking up and giving way to more and more nuclear families. With the increase in education and urbanisation, there is increase in women labour force participation and in turn migration from rural to urban areas. All these changes are likely to alter the living arrangements among elderly. Not only the actual living arrangement but also the preference for a particular living arrangement may also be depending on the type of family. An attempt has been made here to see how the family characteristics influence the living arrangement preferences of the elderly.

Table 5 : Family Characteristics and Preferred Living Arrangements among Elderly in Orissa.

Variables	Preferred living arrangements (%)				Total
	Living alone	With spouse & children	Married sons	Married daughters	
	Type of household***				
Nuclear	4.6	79.8	15.6	0	100 (109)
Joint	1.1	70.5	25.3	3.2	100 (191)
	Composition of household*				
Single generation	4.9	72.1	23.0	0	100 (61)
Two generation	4.1	85.1	8.1	2.7	100 (74)
Multi generation	0.6	69.7	27.3	2.4	100 (165)
	Head of the household*				
Self	4.1	79.1	16.2	0.7	100 (148)
Others	0.7	69.1	27.0	3.3	100 (152)
Total	2.3 (7)	74.0 (222)	21.7 (65)	2.0 (6)	100 (300)

* Chi-square test is significant at $< 0.01^*$ & $< 0.10^{***}$

(Number of observations are in the parenthesis)

Source: Author's calculation

The analysis (table-5) shows a clear link between the family type of the elderly and their living arrangement preferences. A relatively higher proportion of elderly (4.60%) who are from nuclear families preferred to stay alone compared to those who are in joint families (1.10%). Since the proportion of nuclear families is on the rise in India and in Orissa, it is quite possible that more and more elderly may prefer to stay alone in the future. In the same way, a higher proportion of elderly (4.90%) are staying in a single generation households preferred to stay alone than elderly staying with multi generation households (0.6 percent). Further, the proportion preferring to stay alone is also higher in households with elderly himself/herself is the head of the household. These findings establish the influence of family characteristics in determining the living arrangement preferences. Since joint family system is breaking down towards nuclearisation of families, more and more elderly may prefer an independent living than living with their children. Therefore proper policies and support systems need to be developed and kept in place to take care of those who prefer to stay alone.

Another important variable that emerged out of the secondary data analysis to determine the living arrangement pattern was the education of the elderly. Clearly, a higher proportion of the better-educated elderly was staying alone in Orissa as compared with the elderly who are not so educated. In the following section, an attempt is being made to see whether education of the elderly plays any role in shaping their living arrangement preferences. Table-6 shows the education and living arrangement preferences. This table clearly shows that with increase in education, the proportion that preferred to live alone, systematically increased. For example, only less than one percent of the elderly with no education expressed their preference to live alone, whereas nearly 10 percent of the elderly with more than 10 years of education preferred to live alone. Interestingly, the proportion that preferred to stay with married sons systematically decreased with increase in education whereas the proportion that preferred to stay with married daughter systematically increased. These findings bring out a clear linkage in the change in traditional value system among the educated elderly from staying with married sons to either live alone or to stay with married daughters.

Not only the family characteristics but also the economic backgrounds of the elderly are equally important in determining their living arrangement preferences. Most of the theories of choice and preference in economics suggest that the economic resources are the most important variable in deciding preferences. However the results of the studies, on income and living arrangement relationship exhibited through various studies are quite inconclusive. Most of the studies from the developed countries have concluded that majority of the elderly with higher income prefer to live alone than elderly with lesser income. However, contradicting findings are observed from the studies in developing countries; some supporting positive relationship between income and living alone and others supports positive relationship between income and co residence. However, the analysis using NSSO data clearly shows that the individual income of the elderly is an important variable determining living alone in Orissa. Hence it will be of interest to see how these relationships are manifested with preference in living arrangement in the context of Orissa.

The economic status of the elderly can be assessed through their income, assets and their economic dependency. In order to understand the economic status of the elderly, data was collected on the monthly income of the elderly, their possession of assets like agricultural land, jewellery, buildings, houses and their status of economic dependency. Table-6 presents the results of economic status and preference in living arrangement. It can be seen from the table that income of the elderly is directly proportion to their preference in living alone. For example those elderly with no income, only less than one percent preferred to live alone. However, when income increased from Rs. 1000 to 3000 and above, the proportion of elderly preferred to live alone also increased from 1.9 percent to 6.9 percent indicating individual income as an important variable in determining the preference. Similarly, a higher proportion of the elderly who are not dependent on others economically expressed their preference to live alone compared to those who are partially or fully dependent on others.

Table 6 : Socio-Economic Variables and Preferred Living Arrangements of Elderly in Orissa

Variables	Preferred living arrangements (%)				Total
	Living alone	With spouse & children	Married sons	Married daughters	
Years of education*					
No education	0.8	62.8	34.7	1.7	100 (121)
Up to 7yrs of education	1.0	77.1	19.8	2.1	100 (96)
Between 8 – 10 yrs of education	2.4	85.7	7.1	4.8	100 (42)
Above 10 yrs of education	9.8	87.8	2.4	0	100 (41)
Income*					
No incomes	0.6	75.5	21.9	1.9	100 (155)
Up to Rs.1000	1.9	55.6	40.7	1.9	100 (54)
Rs. 1000 – 3000	3.0	72.7	21.2	3.0	100 (33)
Above Rs. 3000	6.9	87.9	3.4	1.7	100 (58)
State of economically dependence*					
Not depend on others	5.5	79.1	13.6	1.8	100 (110)
Partially dependent on others	0	52.9	41.2	5.9	100 (17)
Fully dependent on others	0.6	72.8	24.9	1.7	100 (173)
Present Occupation*					
Agriculture & related works	3.8	76.9	19.2	0	100 (26)
Non agriculture: Business	0	77.8	11.1	11.1	100 (9)
Household work	4.5	85.1	9.0	1.5	100 (67)
Retired	5.1	89.8	3.4	1.7	100 (59)
Not working	0	60.2	37.5	2.3	100 (129)
Casual labour or coli	0	80.0	20.0	0	100 (10)

* Chi-square test is significant at < 0.01 *

(Number of observations are in the parenthesis)

Source: Author's calculation

Occupation of the elderly and their living arrangement preferences indicate that a higher proportion of the elderly (5.10%) who are retired from services preferred to live alone than who are engaged in other occupation. However, all the elderly who are working as labourers or those who do not work preferred to be in co residence. This indicates the role of social security measures in shaping the living arrangement preferences. Most of the retired people either may have pension or savings to support them in the old age and therefore they prefer to have an independent living unlike labourer who may not have any social security other than their family.

From the following section, it is clear that individual income of the elderly is positively related to the preference to living alone. In Orissa, as in India, it is customary that an elderly normally live with his/her family and the data also show that the majority not only live in co-residence but also prefer too to do so. The preference data also show that a higher proportion of younger elderly, elderly with no surviving children, educated elderly and elderly who are economically independent preferred to live alone than their counterparts. This apparently suggest that the living arrangement preferences are highly influenced by the condition of actual living arrangements and the determinants of actual living arrangement and the living arrangement preferences are nearly the same.

Actual and Preferred Living Arrangement

Adherence to the preferred living arrangement can only happen when the elderly is able to exercise their choice. But there could be several constraints for the elderly that exist in exercising the choice of stay. There are two different contexts by which the actual and the preferred place of stay can differ. As commonly observed, inadequate social security measures and poor financial circumstances force the elderly to have no hold on their choice on place of stay. Secondly, it may be also possible that there is a considerable difference in the mind-set of older generations and the younger generation regarding the care of the elderly. While the older generation will still prefer to stay with their children, the younger generation might consider the elderly as a burden and therefore they may not be willing to keep them (Asis et al., 1995; Domingo and Asis, 1995). In this context also, the actual and the preferred place of stay may vary not because of the economic reasons

but due to changing cultural norms (Burr and Mutchler, 1992; Lee, et al., 1995). As much of the information on the preference of the elderly with respect to their living arrangement and deviation between the actual and the preferred place of stay are not available, it will be of great interest into these areas. The following section discusses this aspect.

The actual living arrangement pattern revealed by the survey show that nearly 15 percent of the elderly live alone in Orissa and the remaining 85 percent are in co residence. However, interestingly, the preference data show that only less than three percent of the elderly prefer to live alone and the rest 97 percent preferred to be in co residence. The actual and preferred living arrangement data presented in table-7 show that out of the 15 percent who actually live alone, only 7 percent indicated their preference to live alone where as the remaining (93 percent) indicated their preference to be in co residence. Among those who are presently in co residence, only 1.6 percent of them indicated their preference to live alone. Apparently these figures indicates that majority of those elderly who live alone actually would like to be in co residence indicating that their living arrangement is not out of their choice but out of various other constraints. This data strongly indicate the preference of elderly towards co residence in Orissa.

Table 7 : Actual and preferred living arrangements of elderly persons in Orissa

Actual living arrangements**	Preferred living arrangements (%)				Total
	Living alone	With spouse & children	Married sons	Married daughters	
Staying alone	7.0	62.8	30.2	0	100 (45)
Co residence	1.6	75.9	20.2	2.3	100 (255)
Total	2.3 (7)	74.0 (222)	21.7 (65)	2.0 (6)	100 (300)

* Chi-square test is significant at $< 0.05^{**}$

(Number of observations are in the parenthesis)

Source: Author's calculation

Deviation in Living Arrangements

The data on the deviation from the actual and preferred place of stay indicate that nearly 23 percent of the elderly are not staying in their preferred place of stay. The proportions those are not staying in their preferred place of stay are higher in urban areas (25.3 percent), among females and among those who do not have a child. The reason for not being able to adhere to the preferred place of stay needs to be analysed to get into more insights about the different issue with respect to living arrangement.

Table 8 : Deviation from Preferred living arrangement among elderly in Orissa.

Variables	Frequency	Percent
Not staying in the preferred place of stay	69	23
Staying in the preferred place of stay	231	77
Total	300	100

Source: Author's calculation

In order to understand the major reasons for elderly not being able to adhere to their preferred place of stay, a question was asked to them to know about the major constraints. A preliminary analysis of this data shows that children's being away is the most important reason cited by the elderly (49.3 percent). No child or spouse (23.2 percent) and lack of money (21.7 percent) are next in order of importance.

There are two different contexts where the actual and the preferred place of stay can differ in India. Firstly, as commonly observed, due to inadequate social security measures and due to poor financial circumstances the elderly are unable to hold on to their choice on place of stay. However, there is a clear lack of evidence in India on the extent of elderly unable to seek their choice due to economic reasons.

Secondly, it may be also possible that there is a considerable difference in the mindset of older generations and the younger generations regarding the care of the elderly. While the older generation may still prefer to stay with their children, the younger generation may consider the elderly as a burden and therefore they may not be willing to keep them (Ramashala, 2001; Tomita, 1994). In this context also, the actual and the preferred place of stay may vary not because of the economic reasons but due to changing cultural norms (Natividad and Cruz, 1997).

Conclusion

Over all the study brings out interesting observations on living arrangement preferences among the elderly in Orissa. It is generally observed that although co-residence is the most preferred living arrangement, preference to live alone was also high among certain sub sections of the elderly. Bivariate analysis shows that demographic characteristics like age, sex and number of sons of the elderly affect significantly on living arrangement preferences. Similarly, education of the elderly and their economic independence are also strongly correlated with the preference to live alone. Further, nearly one-fourth of the elderly are not been able to adhere to the preferred living arrangement. In this scenario the policy maker should consider the living arrangement preference while preparing the policy for elderly. The policy for the elderly should be in such a way that the elderly can able to meet their preferred living arrangement. So the policy should be made in such a way that the elderly should be encouraged to live with their family. For this reason the family based incentive measures should be taken into consideration where the elderly be one of the family members in the household. For example some proportions of tax exemption (in the form of income tax, property tax, agriculture subsidies etc.) should be given those households where at least one elderly is the member of the household. Apart of this some other form of incentive should be taken into consideration in which the elderly member in the household would be treated as assets not a burden to the household. If this will be the case some extent the majority of household would heartily welcome to their old parents to live with them in substitution they will get some direct financial benefits for taking care of their parents.

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Labour Migration to Middle East Countries Consequences on the Lives of the Elderly Left Behind

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ABSTRACT

The present paper presents case studies of elderly belonging to Hindu or Muslim religions. These elderly were left behind in the homes by their sons, who migrated to gulf countries to earn their living.

Key words : Elderly left behind, Lonely widowed mother, Empty next, Survival of the elderly.

Human migration in search of better future prospects has become a flourishing process in almost all countries over the world, including India. But during the beginning of twentieth century migration from India was only on a small scale. After the middle of the century migration became the way of life of many of the people of India. At first migration was confined to states within India, and later the scale of migration increased by crossing international borders. The international migration of workers during the post independence period may be divided into two phases. In the first phase persons with administrative, technical and professional qualifications migrated to UK, US, Canada, Western Europe, Australia and African Countries in search of better jobs and financial prospects. In the second phase of migration people migrated to the oil rich Middle Eastern Arab Countries (Prakash, 1998). This migration, commonly known as Gulf migration, had attracted a number of people from the different states of India, particularly from

the state of Kerala. Then emigration from India to the Gulf is by and large a Kerala phenomenon (Joseph, 2006).

Emigrants from Kerala to Gulf can be included in two categories: highly qualified persons or persons with high skill levels and less educated persons with less skill levels. Studies on migration in Kerala pointed out that majority of the migrants from Kerala to the Middle East belonged to the second category of unskilled male workers doing manual or construction related occupations. Labor was recruited for work in Gulf on strictly limited contract terms and they were expected to return home at the end of the contract period. The wage they get was not sufficient to bring their wives and children to Gulf. Moreover, they wanted to save as much money as possible for the future of their family within the period of their stay at Gulf. As a result of it migrants could not take the family members to their workplace. So the emigrants were forced to leave behind their family members in Kerala. Kerala society witnessed many crucial changes due to this massive male emigration to Gulf countries.

The phenomenon of Gulf migration has been experienced in Kerala in a concentrated form since the first half of 1970's due to the oil price hike in the international market during those years. The Gulf countries with huge deposits of petroleum were the major beneficiaries of this situation. The economy of Gulf countries showed high growth rate which offered large number of job opportunities to outsiders as the human resource in Gulf was not sufficient to meet the requirements of their domestic economy. Studies show that migration has influenced every facet of life in Kerala including social, economic, political, demographic and even religious. Most of the social institutions are forced to adopt some changes as a result of the Gulf connection of Kerala society. Almost all families in Kerala are affected by the migration to Gulf region in one way or another (Zachariah; et al, 2002, 2003). It has contributed substantially to an increase in the dependency burden of the state (Zachariah; et al, 2003). Migration of any one of the male member of a household seems to have an impact on the members left behind irrespective of marital status, age, religion or caste of the migrant. But the extent of such impact is varied from person to person and is closely associated with the dependency of the left behind and their relationship with the emigrant. As the category which need more care

and support, the elderly parents are much affected by male migration. This study is an attempt to explore such consequences of emigration of laborers on the elderly left behind in Kerala. The overall objective of this article is to highlight the effect of male emigration to Middle East on the lives of both sexes of the elderly parents living in the sending areas.

Methodology

Case study method was adopted in the present investigation in order to assess the impact of male emigration on the elderly father and mother left behind in the sending area. Six respondents including three males and three females were selected by following the rules of purposive sampling. Out of the six cases three belonged to Hindu community and the rest were Muslims. All the subjects were selected from the fifth ward of Edava Gram Panchayat in Thiruvananthapuram District of Kerala state.

Definition of old age is not the same throughout the world. Based on the internationally accepted definition, an elderly person is the one who is sixty five years of age or above. In India, all persons who are sixty years or above are included within the definition of elderly. Indian definition is adopted here. Parents of the male migrants whose sons are working as laborers in the Middle East were selected as the population of the study. Those old parents having male migrants in the Middle East engaged in white collar and related occupations were excluded.

Features of the study area

Edava is considered as one of the 'Gulf Pockets' of Kerala. The area has a long history of emigration. So many people from Edava emigrated to Singapore, Malaysia and London since the very beginning of the twentieth century. When Gulf countries emerged as the fertile land for emigration from Kerala on a massive scale during the later half of the twentieth century, the people here shifted their attention to these oil rich Arab Countries. Now almost all the families in the area have at least one male migrant in Gulf Countries and all the people are affected by Gulf migration in one way or another. Those households succeeded in sending one male member to the Gulf have got the ability

to send other male members. As a result of it a good proportion of the households are left with old males or become altogether female headed.

This Panchayat has some uniqueness. Almost all the wards are dominated by Muslims. In the selected fifth ward Muslim and Ezhava Hindu families are found. Muslims in the area are practitioners of matriliney and matrilocality. Daughters live with their own parents after marriage. There are some exceptions too. In some rare circumstances such as, if there is no daughter in the house of the husband or if the husband is the only offspring in his family; the wife may suppose to stay with the husband's family. In such cases the parents of the boy will have to seek prior permission from the parents of the girl to bring her to their house after marriage. The landed property and ancestral house are transferred through females. Another feature of the Muslims in the locality is that they practice village endogamy. That means the people prefer to select mates from within their respective villages. Generally the locality is educationally backward and most of the people are blue collar workers. This low level in the acquisition of education and skill level leads the emigrants from Edava to work as laborers in Gulf. Before the Gulf boom people in the locality were engaged in fishing and coir work. Emigration to Gulf has brought changes in the attitude of people including Muslims and Hindus towards their traditional occupation.

Elderly Left Behind: The Profiles

The experiences of six elderly persons gathered through case studies are briefly presented here. All of them were left behind in the home by their sons who migrated to Gulf.

1. The lonely widowed mother

Gomati, the sixty four year old Hindu widowed mother has seven children including two sons and five daughters. She lost her husband around eleven years back. All the five daughters got married. After that, all of them went to their husbands' families. Her elder son has been running a tailoring shop near his independent household, which is more than ten kilometers away from the house of Gomati. The younger son, Murali is an emigrant who is working as a manual laborer in one of the reputed private firms of Dubai. All the children; including the emigrant, are leading a comfortable life with their spouses and children.

Gomati belongs to a family of coir workers in the same village where she is living now. Having attended school for four years she can read Malayalam but cannot write. Until she got married, she helped her parents in coir work along with her siblings. She was married to an able bodied manual worker at the age of fifteen. Three years after that, she again started her engagement in coir work. She enjoyed doing this work in the company of ladies from the neighborhood. She sent all her children to school and all of them completed their high school education. She sent Murali to higher studies after noticing his intense interest in studies. He had desire to migrate to Gulf like some of the other young people in the area. Through Gomati's brother's contact they did locate a recruiting agent. The brother assured that the agent is a reliable person who can be trusted. After completing Pre-Degree and a certificate course in computer application he migrated to Dubai with the financial assistance of one of her sisters' son. The job they offered to him was clerical in nature but he could not get that job. He was cheated by the agent. Later he got appointment in the company where he is working at present with the help of some of his friends working there. The owner of the company was satisfied with his hard work and sincerity. He repaid the debts due to finance emigration within one and half years. During his first visit to home he married a girl from a well-known family selected by Gomati.

Gomati is now living alone in the house where she lived with her husband and children in the past. Before three years she was not alone in that house, as the wife and children of Murali lived with her. During his last visit he built a new house and now his family is living in that house. They always invite Gomati to that house but she does not like to leave the house where she can live with the memories of her late husband. All the children talk with her through telephone and visit her at irregular intervals. They are busy with their activities and family matters. So they have no time to understand the old mother's feelings and sorrows. The health problems like body pain and head ache intensifies her worries. Gomati said that her six children except the emigrant son are not ready to understand her. Till his last visit the emigrant son spent his days in the home land with her. Now she fears that the son will not stay in her house and will prefer to stay in his newly constructed house. In addition to these problems she is very

much disappointed with the misbehavior and cruelty of one of her sons in law to her.

Even though, the old mother has seven children and many grand children she is living alone. Nobody is there to support her. Sometimes she is haunted with loneliness. This motivated her to take the decision to engage in coir making in spite of her ill health and oldage. Through this she tries to regain the happiness which is lost. In addition to this it provides an independent income to her and makes her self-sufficient.

2. The mother with crisis

Fatima, the seventy two years old Muslim mother was born in the same house where she and her husband have been living. She got married at the age of twelve years and gave birth to three children. But now she had only two children including a son and a daughter. One of her sons died before years. After marriage her daughter went with her husband to live in his village. This village is far away from the house of the parents and that area is patrilocal in nature. Till the last year, wife of the emigrant son, Ashraf was at her ancestral home and now she is living in the house of in laws with children due to the death of both of her parents. Earlier Fatima's husband looked after the family by providing his income from fishing. But now he cannot go to sea because of ill health.

Her only son Ashraf who possesses only primary education has been working in a fiber company in Dubai. He migrated to Gulf nine years ago. Now he is doing unskilled work in the fiber company. His work is highly risky in nature. Salary is irregular and is not proportionate to the workload and nature of work. The family is entirely dependent on the money from the emigrant son. There is no other productive member in the family and no other source of income. Her husband did not get the fishermen pension even though he is eligible for that. Now Fatima's family is going through crucial economic problems. Ashraf migrated to Gulf for a contract of ten years and this is the final year of contract. So he will be forced to come back to the home country within one year. Being a man attended school for only six years he cannot avail any good job in the home country. She does not have any family property other than the small house with tiled roof and mud floorings and five cents of land. The mother is very much anxious about the future of the son and his family.

Usually Ashraf contacts her wife and children at a regular interval of two weeks. But he is not much interested to talk to Fatima on each time. He talks with her very rarely, most probably with an interval of one or two months. He sends money in the name of the daughter in law and she spends it for the family. Fatima feels that the son's concern and love towards her had decreased after migration. She is a patient suffering hypertension since the last five years. Once she had stroke and had to undergo highly expensive treatment. Now she has recovered from it but the treatment is going on. She can walk inside the house but cannot go out alone. She never goes out except to hospitals, funerals and other necessities. Usually the daughter in law accompanies her on each of her journeys. As a result of it she cannot go somewhere when she likes. She has to wait for the convenience of her daughter in law. She thinks that the daughter in law is helping her only for the sake of showing it to her emigrant husband. According to her opinion the daughter in law does not love her and not ready to share her sorrows and pain.

The daughter in law is an all rounder in the family. She wakes up in the early morning, and after offering prayer to God she starts her regular work. The mother in law is not satisfied with the money spending pattern of the family. She thinks that the reluctance of the daughter in law to spend money for the needs of the mother in law is affecting her health negatively. The family needs an amount per week for meeting the medical expenses of both parents. But they cannot spend this amount by themselves and she is worried about this problem. Ashraf could not save anything during his nine years long migrant life. He could not acquire any assets for the family. Even the debt of the family due to finance the emigration has not been repaid yet. The mother is praying to God to relieve her from these problems. She feels helpless in the present circumstances.

3. The mother who leads a normal life

Suseelamma, the sixty four year old Hindu elderly female was married at the age of eighteen and migrated to the village of Edava from her village situated so many kilometers away from here. They have five children including three sons and two daughters. She is living with her husband, widowed daughter and grand daughter. The daughter is a school teacher who is working in a nearby Govt School. All the

three sons are working in Saudi Arabia. One of the daughters also migrated to Dubai with her husband who is working as a salesman in a jewelers shop. Suseelamma's husband was a gulf migrant who completed fifteen years of migrant life. When the sons were grown up he returned to the home and sent the eldest son to abroad. Later, the younger sons were influenced by the work and life in Gulf. The first son sent visa to the younger ones and made sure their appointment and nature of work in Gulf. After a few years both the sons migrated to Gulf with the support of the elder son.

All the children had completed their school education successfully. The daughters were more interested in studies than the sons. One of the sons has been working as a salesman in a shopping centre and the others are working in a hotel. Their work is not so good or prestigious but they got their salaries before coming back to Kerala on each times. Two of the sons got married and built separate houses before completing six years of their migrant life. Both the sons constructed their own houses within one kilometer of the parental home. Their wives and children are living in those houses. The youngest son who is now forty years old remains unmarried. While visiting home he spends his days in Kerala with the father, mother and sister. The mother always forces him to get married but he is not interested in it. It creates arguments and counterarguments between the mother and son during the son's home visit.

All the emigrant sons contact the mother in every week or fortnight. Their wives and children visit her when they have time. They show interest to take her to their own houses. Sometimes she goes to their houses and spends two-three days with them. She does not like to live more days in their houses because of the attachment with the widowed daughter and her child. The emigrant sons never send money to her or to her husband regularly. Even if there is non availability of remittances from emigrant children on a regular basis she does not have any financial problems to meet her or her husband's medical and other needs. She is satisfied with the behavior and care of all the children. The intensity of love and concern is higher between the mother and the daughter who is living with her. She manages all the matters of the old parents and the family without showing any difficulties. She spends a portion of her salary for the medical care of them.

Suseelamma leads a peaceful life in her old age with her husband even though four of her children are working abroad. She views the life of the emigrant children with pleasure. Unless they had migrated they cannot lead such a life. On each visit they bring with them marvelous apparels and kitchen utensils which create jealousy in the minds of the non-migrants in the neighborhood. They send their children to expensive private schools and the family has the ability to seek better healthcare facilities. She thanks God for sending her children to Gulf Countries.

4. **Lonely in the midst of a crowd**

Mohammed Abdullah and his wife have been living in their present house since the last thirty five years. They have two sons and two daughters. The two daughters whose husband's are working in Gulf are living with the parents. Both of the sons are working as menial workers in Razz al Khima airport. He was an efficient manual worker of the area in the past. Now he is seventy two years old. His age, poor health and social status as the father of Gulf migrants does not now allow him to do work. So he does not have any independent income and is totally dependent on others to satisfy his needs. The sons were interested in studies. But he could not satisfy their interest because of his financial problems. The difficulties in the home forced the sons to drop out from the school who later engaged in manual labor. Now he is worried about his inability in the past which denied even proper school education to his children.

Both the sons had selected their mates from the same area which is situated within five hundred meters from the parent's house. Both the daughters in law are living with their own parents. Sons had no contact with their family members because their wives and children are not here. They always communicate with their wives in every week. Communication through telephone is expensive and so they cannot make phone calls to the parents regularly. The sons never stay with him during their home visit because the custom here necessitated the sons in law to live in the house of their wives. They also send major portion of the money to their wives. Occasionally they send some amount of money to their parents. But the family mainly received money from Gulf from the sons in law. They send money to the family regularly. The money is received by the daughters and they pass it to their mother.

All the finance of the family and assets are managed by the wife of Abdullah. There is no property or savings in his name. All the assets including the house where they have been staying is in the name of the wife. Even the money sent by the sons to him is also taken by the wife. He does not have any role in the family decision making. All the decisions related to the family and spending of money are taken by his wife. The daily purchase of essential goods from the local shops is his only responsibility to the family. He is not able to satisfy his needs because of the lack of money. He is disappointed because he never gets even enough food of his choice and dress. He is a patient undergoing treatment for heart disease and he has difficulties to buy medicines regularly. The daughters take him to the hospital when he is sick and for routine checkup. He is happy with the presence of grand children. The moments spend with them helps him to forget his sorrows.

He is worried of the feeling of loneliness and insecurity because of the repeated theft attempts in his house during night. He is the only grown up male member in the family. There are seven people living with him. But he feels that nobody is here to share his thoughts and sorrows. His relationship with the children, in laws and grand children are healthy. His major problems are related to the relationship with his wife. The wife is behaving cruelly to him especially during the absence of male children. Sons' migration never improves the mental or physical health of the old father and the economic position of his family. But it improves the financial condition of the family of their wives.

5. Member of an empty nest family

Sivan Pillai and his wife Jayasree are living in a rented house near a Temple. They have two married daughters and they are living in the houses of their husbands. The only son has been working as a construction laborer in Dubai for the last eleven years. He migrated to Gulf after completing his Pre Degree. But he did not get white collar job there. Sivan Pillai is a Gulf returnee. He was a migrant laborer in Kuwait. Until his migration he worked as a construction worker. He started working at a young age as a salesman in an ordinary shop. Then he migrated to Gulf with great ambitions. He came back to Kerala during the Gulf war. His health problems did not permit him to return to Kuwait after the crisis is over. Then he decided to send his son abroad. He took the initiative for arranging the migration of the son to Dubai

with the help of his friend working there. He got an amount as compensation for compulsory return from the Govt of Kuwait. He had spent it for the emigration of son. He spent his earnings from Gulf to construct a new house and to send her daughters to rich families as brides. Now both the daughters are happy with their family life.

After five years of the emigration of son, Sivan Pillai became a heart patient. He has been undergoing treatment for the last six years. It is necessary to go to hospital for regular check up. The wife accompanies him on his journeys because he cannot go out independently. The huge medical expenses are not affordable to him. He spends all his savings for the treatment. So he was forced take the decision to sell the house which was a major asset of his fifteen years long migrant life. He is not at all interested to live with the family of daughters. Then he shifted his life from the big house to a small rented house with his wife. To make matters worse, the son never got his salary regularly. So he could not send money to the parents when they need it. His remittance to the parents was either irregular or inadequate to meet the expenses.

The children including the emigrant son are affectionate to the parents. Daughters make telephone calls to them on two or three times in a week to know the health condition of the father and other matters. They visit them when they get time with their husbands and children. But they cannot stay with the parents because it may affect the convenience of grand children to go to schools. The wife of the emigrant son is not ready to stay with them during the husband's absence. Her behavior to them is good; she talks with them over telephone regularly. But she and her child are staying in her ancestral home with her parents. The son never had regular contact with the parents. Sometimes he takes an interval of one and a half or two months between two communications. The reason of it may be his concern about money. When he reaches home he spends most of his time in the house of the parents with his wife and child. During the son's presence daughter in law has no problem to stay with them.

Nobody is there to help Sivan Pillai and his wife during emergencies. He is worried about the feeling of insecurity and loneliness when the son is away. He never had such problems in the past. But the dependence, diseases and consequent ill health negatively changed his

mental state. The presence and care of the wife is the only relief for him.

6. Holding with traditional occupation

Abdul Rahim, a sixty five years old Muslim father is living with his wife. He has three children including two male migrants. He was born in a fishermen family and had four brothers and three sisters. He started fishing at an early age and is continuing with this work. He gets an annual fishermen pension of one thousand and four hundred rupees. He doesn't like to give up his traditional job because of his financial problems. The family needs his income too to meet its economic needs. Both of his sons were engaged in fishing before emigration and they are doing the same work in the Gulf. They are not familiar with any other work. Both of them are working and living in the same place. His married daughter and her family are staying with him. The son in law who is a fisherman is very much dedicated to the family of his wife. As the custom practiced in the area, his daughters in law are living with their own parents.

There are two migrants in the family of Rahim. But he never feels any positive impact of it on the economic condition of the family. The emigrant sons never send money to him or his wife. They send money to their wives and they give a portion of it to the parents when their husbands demand it. The sons never communicate with Rahim regularly because their wives are not living in his house. He is not satisfied with the lives of the sons who are working in Gulf. Their work is seasonal in nature. They have employment only for six months of the year. There is no job and salary for them during the other six months. The employers never pay the travel expenses of them. So they are forced to remain there during those six months. They engage in some other work to meet the expenses of that time. Both of them have only two or three years of schooling and are almost illiterates. So generally they only get jobs like menial work and loading. They cannot continue with such jobs for more days because of their unfamiliarity in those works. Last year one of the sons came back here and had stayed here for around six months.

Even though, the son in law is living with him, Rahim is the head of the household. Members of his family have respect and concern

towards him. He has the ability to take care of all the family responsibilities. When he needs help, all of his family members and relatives are ready to give him a helping hand. Sons' absence does not affect the harmony within the family. All the children and grand children are affectionate and he is really satisfied with their presence and help.

His only problem is the lack of money to meet the medical expenses of the wife. Wife is suffering from diseases like rheumatism and hypertension. His earning is not sufficient to meet the treatment expenses. His family is not fully dependent on the remittances from Gulf. Occasionally he gets a portion of son's earnings from Gulf. He never demands money from them. He and his family members are living with the earnings of him and his son in law from fishing.

Survival of the Elderly Left Behind

The in depth analysis of the six cases led me to identify the important issues with regard to the impact of the emigration of sons to Middle East in search of job opportunities and better future prospects for parents left behind. The issues addressed here such as living arrangement, participation in income earning, source of family finance, communication and behavior of other family members including emigrant, acceptance within family, physical and mental health problems, changes in the financial position and quality of life are analyzed below.

As a result of migration of the protective male umbrella, the structure of the family and living arrangement of the family members got changed. The changes in the living arrangement of the elderly left behind are more considerable. Findings of the study show that in all the cases except one who lost their house, parents are living in the same house where they were living before the emigration of sons. There is one widowed mother and she is living alone for the last three years. Two empty nest families were identified here. The non migrant children and the parents are living in the same district but they cannot live under one roof because of their personal peculiarities and convenience. One female elderly person and her husband are living with the wife and children of the emigrant son. All the others are living with their spouses and the family of daughters. Muslims in the study area are matrilineal in nature. So their married daughters remain with the parents and the daughters in law stay in their ancestral homes. Generally the Muslim

parents in the locality selected spouses for their children from within the village. So both the family members get opportunity to visit each other frequently.

Before Gulf boom people in the locality were engaged in fishing, manual work and coir work. Their life was totally based on the sea and the backwaters. It is a common opinion that after mass migration to Middle East majority of the people from migrant households who were engaged in the traditional occupations had abandoned the same. Here, two of the persons including one elderly male and one elderly female have been continuing with their engagement in fishing and coir work respectively. The elderly lady who is doing coir work considers it as a means to make supplementary income and to escape from worries and tensions. She is living alone in her house and so the engagement in work is really a relief for her. The elderly fisherman considers his work as part of his daily routine and life. He believes that he is very good in his work. All the other four are not engaged in any income earning activities.

Most of the families of the migrant laborers in Edava do not have any landed property or have small pieces of land. It prohibits them from acquiring earnings through agriculture. In some families there are no productive male members present here. All the able bodied males are working in Gulf. It does not mean that all of them have huge savings. In this context the family does not have any other source of income other than the earnings of the migrants. Here in three cases family and the left behind elderly are fully dependent on the Gulf migrants and there is no other source of income. The other three have only partial economic dependence on the migrants.

All of the migrant sons communicate with their parents with irregular intervals over telephone. But their communication with their wives and children are regular. In all the cases the elderly opined that the son's love and attachment towards them had decreased after emigration. Sons' attitude towards them can be seen in the matter of sending of remittances also. None of the parents had received money from the son's regularly. All of them except two got money from the migrants. But it is irregular and inadequate to meet even their medical expenses. In one case the son sends money to the daughter in law and

she spends it for the family on the basis of her will. In the other case the emigrant son sends money to his wife and directs her to give a portion of it to the parents.

The elderly parents expect more care and support from their non migrant children and grand children during the migrant's absence. Except three all the others are living with the family of their daughters. While staying with one child the others will visit them when they have time. Four of the parents said that the children and other members of the family are not understanding them and not showing love to them. There are persons like spouse, daughter, in laws, grand children and other relatives to manage the family and look after them. But they feel the absence of male children. The behavior of other family members is not so good in all the cases. One elderly female who is living alone noted that she has some problems such as lack of persons to help and disobedient behavior of son in law during the absence of son. One father has the problem of arrogant behavior and cruelty by his wife. This becomes more acute when the son is away. An analysis of the cases shows that the position of elderly parents within the family does not have any positive relationship with the migrant status of the sons. In one case the father got respect within the family because he is the provider and head of the family. In other cases we cannot see such a prominent position enjoyed by the parents left behind.

All of the elderly people mentioned here have health problems such as hypertension, diabetes, heart diseases and so on. There are persons in their families for taking them to hospital whenever necessary. But they cannot avail proper health care facilities because of the lack of sufficient money. One father left behind was forced to sell the house where he had lived to meet his medical expenses. All of them have feeling of loneliness, isolation, insecurity, disappointment in life and uncertainty about future especially during the period of son's absence. The reason behind it ranges from lack of persons to support them or share their sorrows to the fear of theft and theft attempt experienced by them. They are worried about the absence of sons at the time of ill health and diseases. In addition to these, concern about migrant sons' problems intensifies their tensions. It includes risky nature of work in Gulf, inadequate salary, seasonal nature of employment, etc.

It is a commonly held opinion that Gulf migration can lead to an improvement in the financial position and quality of life of the migrant's family. Migration enabled many people to possess land, house, savings, and consumer durables and improved the quality of life. The persons who acquire all of these or some of these consider migration to Middle East as a positive thing that enriches their lives. But this is not true in the case of all the migrants particularly among the labor migrants. Analysis of the cases shows that the positive results of migration are not so positively experienced by the left behind elderly. The economic and other gains are mainly beneficial to the migrants, their wives and their children. Benefits of it for the parents are very little. There are cases without any financial improvement even to the migrant person. In one case, the son will have to come back within months because of the completion of contract term. He could not possess any assets till now. Even the indebtedness due to finance emigration is not completely cleared. The only source of money of the family will be ended within some months. The elderly mother is afraid of the coming uncertainty in the life of the son's family.

Conclusion

Migration of male members to Middle East has a major impact on the family members, especially on the elderly left behind. In all the cases presented here the left behind elderly are facing many hardships and crises irrespective of their gender and religion. But the problems faced by such elderly are varied from person to person. The problems are social, psychological, economic or physical in nature. It is a reality that these people are deprived of the care of male children in their oldage, the period that needs more care and support both for the body and for the mind. If there is a good network of relationships and understanding within the family the condition of the elderly left behind would become healthier. It needs a reorientation of approach within family about the care of elderly left behind in order to assist them and make the twilight of their life much happier.

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Elderly Prisoners and the Nigerian Criminal Justice System

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ABSTRACT

Over the years, the concern of most gerontologists has been on the study of life course of people in the free world while less attention has been paid to senior citizens in secluded institutions like the prisons. Criminological research in Africa have not fared better on this issue as most research have been based on youth criminality within and outside the criminal justice system. This article therefore presents the issue of elderly inmates in the criminal justice system within both criminological and gerontological perspectives. In Africa, the place of the elders is usually that of honour irrespective of social or economic status, and the status of elder come with certain expectations. The case of the aged elders in the Nigerian criminal justice system is exacerbated by the philosophy underlining the criminal justice system which is more of retribution than rehabilitation. In describing the state of elders in Nigerian prisons, the article is of the opinion that the needs of elderly offenders may actually be more appropriately met in other sectors rather than criminal justice services. The article concludes with some programmatic implications on the state elderly inmates and some recommendations are also suggested.

Key words : Gerontology, Criminology, Elderly, Prisoners, Nigeria, Criminal justice system.

The concerns of most gerontologists have been on the study of life course of people in the “free world” while less attention has been paid to elders serving in the prisons. This also has a bearing on

criminological research, which has seen lots of concentration on the activities of “young” offenders within and outside prisons at the detriment of “older” felons (Brogden and Nijar, 2000). This may be situated partly in the penal philosophy underlying the criminal justice system, which emphasizes retribution over rehabilitation and would not tolerate that any prisoner deserves any form of “luxury” whatsoever. In that sense a prisoner is considered as a “public enemy” whose incarceration is of immense benefits to the society, irrespective of his/her age.

The social explanation of age in gerontological studies stipulates that age comes with certain social expectations and responsibilities. In order words, an aged prisoner deserves as much regard/attention as his/her non-institutionalized peers, irrespective of his/her status. Moreover, the Nigerian Criminal Justice system is replete with stories about those who cannot be considered as criminals as over sixty-five percent of inmates in Nigerian prisons are still awaiting trials (Prawa, 2006; Amnesty International, 2008; Ikuteyijo, 2008). This implies that majority of these elderly inmates may still be awaiting trial for the offences they were charged with. As a matter of fact, some of these awaiting trial inmates have spent as much as ten or more years in detention (Ibe, 2005; Prawa, 2006). Hence, an offender who was incarcerated say at the age of forty-five and is on awaiting trial for over ten years can actually age while in prison. There are other reasons why the geriatric prisoners deserve the attention of both gerontologists and criminologists alike. Studies have established that health situation in Nigerian prisons is poor and most prisoners experience more rapid deteriorating health due largely to inherent abysmal medical state of most prisons; and the stresses associated with prison life among others.

On the global level, the penal system is fast tending towards a better understanding of the state of elderly inmates and activities geared towards meeting their needs. This is demonstrated in the establishment of geriatric wards, which cater for the special needs of the elderly inmates. This paper therefore attempts a synergy of gerontological and criminological explanations of the state of elders in prisons as well as proffering solutions on policy measures aimed at improving the lives of the elderly in Nigerian prisons. For the purpose of this study, the operational definition of elderly inmates include male and female inmates who are fifty years old and above. The history of imprisonment as well

as changing philosophies behind the use of prisons as a form of punishment will also be looked at in this paper, paying particular attention to prison health and the senior inmates; looking at the global trends of geriatric inmates as well as suggesting policy measures to alleviate the plight of elderly inmates in the Nigerian criminal justice system.

Prisons and Penal Philosophies in Nigeria : The Genesis

In Nigeria, the history of modern prison system is traceable to the era of colonization, when the first prison was built in the year 1872 and was located on Broad Street in Lagos (Rotimi, 1982; Enuke, 2001, Ebbe, 1990; Ikuteyijo, 2008). Since then the modern Nigeria prison has taken after the British system. Rotimi (1983) observed that the Nigerian prison system did not follow a particular pattern but reflected more of the inherited retributory philosophy. Oloruntimehin (1984) also observed that the emergent legal system in Nigeria could still be regarded as a miniature English legal system despite several efforts made by the indigenous political authorities to initiate new and abolish some old legislation. With reference to the age of offenders, though most prison studies have shown that the majority of inmates in prison usually fell between the ages of 23-29 (Orubuloye *et al.*, 1995), and the impact of the youthful age on crime and other related issues have been well documented, the elders are also represented in the prison population but issues relating to elders and crime have received less attention in the literature. The challenges which some of these elders in prison usually go through is often reflected by the philosophy underlying the penal system of the country. In most cases, they are made to undergo similar harsh conditions like younger inmates. This is so in very unhealthy conditions for which most Nigerian prisons are noted. The criminal justice system does not recognize the “age” of offenders to make room for special treatment of elders. The only reference to age is in the case of minors (under 18 years) and most prisons were built with the young offenders in mind and they would have to be adopted to meet the needs of the elderly inmates. Moreover, the literature on penal and criminal justice system is not often addressed towards the issue of elders in the prison but the growing concern for the wellbeing of the elders (irrespective of status; free or institutionalized), has given rise for the need to address this issue. The kernel of this paper will therefore be to

access the challenges faced by elderly inmates with a view of advocating certain policy guidelines in line with global trends.

Prison health and the Geriatric Inmates

Researchers have presented different theories to explain the rapid physical and mental aging that occurs in prison. Some suggested that increased health problems are as a result of an inmate's past lifestyle (Koslov, 2008). Many inmates arrive in prison after a life of substance abuse, poor diet, deficient medical care, and risky sex, which make them highly susceptible to early aging (Aday, 2003; Erger and Berger, 2002; Koslov, 2008; Ikuteyijo, 2008). It is also more likely that older inmates arrive in prison in poorer health than the general population, giving the socio-economic status of most inmates, which could be described as low. Moreover, an incarcerated person's health is notably worse than that of a community senior citizen's or of a younger inmate's (Koslov, 2008). Other explanations of poor prison health suggest that the prison environment exacerbates the already poor health of inmates. The precarious state of prison health is well documented (De Viggiani, 2007; The Lancet, 2005) and that of Nigeria has enjoyed more attention (Oyesoro, 1995; Kayode, 1990; Asuni, 1990; Akinkuotu, 1997 Adesanya *et al.*, 1997; Ikuteyijo and Agunbiade, 2009). However, all of these studies did not address the elderly inmates but concentrated on the general deplorable state of prison health. Furthermore, those who were identified as vulnerable groups in previous studies were the mentally sick and substance abused inmates. But the health of the elderly inmates calls for more attention. This is because there is every reason to expect that the stresses of prison life will impact on the already greater vulnerability to illness of the aged and they are more likely to suffer from diseases like vascular, neurological, endocrinal and respiratory disorders than their non-institutionalised peers (National Health Committee, 2007). Some may have problems with walking while some others may even require to be placed on special diet.

Besides the physical health of elderly inmates that is endangered by the prison environment, their mental health may also be affected. This may result, among other factors from their interactions with younger inmates who harass them on regular basis as the prison is known for a place where physical strength often prevails over other variables and the “strong” would readily impress his/her “authority” over the “weak”

to extract loyalty from other inmates (De Viggiani, 2006). Some researchers, offering a theory for poorer health in geriatric inmates have suggested that younger inmates may be harassing their older peers, thus contributing to poorer health. These researchers were of the opinion that younger, violent prisoners harass and potentially harm their older peers, thus leading to a more anxious and depressed older prisoner (Rubinstein, 1984; Koslov, 2008). This is suggestive of the policy that offenders should be segregated on age basis buttressing the need for the establishment of geriatric wards in prisons. Giving all these arguments on the precarious state of prison health vis-à-vis the health of elderly inmates, it is logical to conclude that the social and implicit cost of imprisoning elderly offenders will be higher and this is of no benefit to the society (Aday, 2003).

The Elderly Criminal; Global Trends

The state of elderly inmates in prison is gradually gaining prominence in the literature but this is restricted to the developed societies. Globally, the increase in the population of elders in prisons can be explained by two critical variables, which are situated within and outside the criminal justice system. On the one hand is the twin-factors of poverty and isolation, while on the other hand is the delay in the criminal justice system. However, some countries have demonstrated age sensitive measures in tackling this phenomenon while some others are simply indifferent about it. In Japan, one of the world's most rapidly aging societies, there has been an increase in elderly crime and the population of senior criminals. Between the year 2000 and 2006, Japan experienced a 160% rise in the population of its elderly inmates (Onishi, 2007). While in prison, elderly inmates in Japanese prisons were given preferential treatment- for example, they were only allowed to work for two hours less than their younger co-inmates. In the United States of America, geriatric inmates are growing very fast (Koslov, 2008). The number of inmates aged 55 and older in federal and state prisons increased 33 percent from 2000 to 2005 (McCaffrey, 2007). Moreover, by 2010, it is projected that one-third of all United States inmates will be over the age of 50 (Neeley, Addison and Craig-Moreland, 1997). It can therefore be concluded that America is dramatically graying in the twenty-first century, and the prison system is experiencing this change as well (Koslov, 2008). However, unlike in

most developed societies where there are accurate data on elderly inmates, the opposite is the case in Nigeria and most African countries where lack of appropriate data contributes to factors plaguing the criminal justice system.

Segregation and Integration of Elderly Inmates

Giving the frail nature of the elderly inmates' health and their vulnerability to abuse (physical and mental) by younger inmates, there have been debates on whether elderly inmates should be segregated from their younger peers. The school of thought which supports segregation hereafter referred to as "segregation school" base their argument on the vulnerability of elderly inmates to abuse and the special medical attention needed by them. In the United States for example, it wasn't until the 1970s when rates of senior citizens behind bars began to increase noticeably that the authorities started to recognize the special needs of geriatric prisoners and thus created special units for the elderly and infirm (Aday, 2003; Koslov, 2008) and by 2002, more than half of the prisons in the country were segregated on age and health basis (Yortson and Taylor, 2006).

The opposing school of thought supports the integration of elderly inmates with their younger peers and posits that the prison system as a whole may benefit from integration as older inmates provide stability, social order and control to the rest of the prison (Rubinstein, 1984; Yortson and Taylor, 2006; Aday, 2003; Howse, 2003). They argued further that since older prisoners are less likely to "act out" or participate in unruly behaviour, they may serve as appropriate models of prison behaviour for new, younger inmates (Belkin, 2005; Howse, 2003; Koslov, 2008). But this theory has been contradicted by the frequent jailbreaks and prison riots, which often occur in prison where there is integration of inmates. For example, in Nigeria, most prisons where prison riot and jailbreak have taken place (e.g. Agodi, Kirikiri, Oko, and recently Enugu) were places where integration of inmates is practised.

While this chapter is not in support of either school, it is important to note that a system that will guarantee the health and safety of elderly inmates is not desirable and should be provided if possible.

Policy Implications for the Nigerian Criminal Justice System

The state of elderly inmates in Nigerian prisons deserves more attention giving the rise in concern for the elderly in the society. This is corroborated by the various abuses the elderly inmates are subjected to from their younger peers as well as the system. Moreover, in view of the fact that keeping an elderly offender in prison is expensive and with little or no gain accruing to the society, it is necessary to make some penal policies, which will not only alleviate the plight of the senior felons but will equally help decongest the already overpopulated prisons and improve prison health. Hence the following policy measures are suggested;

Implementation of alternative to imprisonment

Just as in more advance nations of the world where there are alternatives to imprisonment as a means of punishment, the Nigerian criminal justice system could adopt such measures as halfway homes, community monitoring, house arrest, and other alternatives, which will put the age and the special needs of the aged offenders in consideration. These alternatives will equally lead to an improvement in the state of prisoners in Nigeria generally and the older inmates in particular. Old offenders could be constrained to special homes where they will be taught on proper reintegration into the society.

Training and retraining of prison personnel

In line with the above recommendation, the implementation of alternatives to imprisonment will invariably entail that prison personnel be trained and retrained to be in tune with global developments in penology. The Nigerian prison service could also go into bilateral or multilateral agreement with other penal institutions in other parts of the world where such alternatives are thriving and helpful in addressing the myriads of problems caused by the over congestion of prisons. The need for prison staff to be retrained in courses like sociology, psychology and social works, which would enhance their human relations as well as understanding of social and organizational dynamics, is necessary. Furthermore prison staff should be trained to meet the special needs of elderly inmates and they should also know that it is quite impossible for the elderly inmates to conform to all the rules and regulations designed for younger offenders.

Overview of the prison institutions to make them accountable to the public

Furthermore, the prison authorities should be made accountable to the public. This can be done by the establishment of committees and bodies, which will oversee the affairs of the prison as an institution. An example on the international scene is the Special Rapporteur on Prisons and Conditions of Detention in Africa (SRP), established by the African Commission on Human and Peoples' Rights in 1996 to address the dire position of detainees in Africa. This is capable of addressing the myriad of problems facing the Nigerian prisons especially overcrowding and curtailing the excesses of some prison officers who are used to abusing the inmates especially elderly inmates.

Encouragement of private partnership in prison administration

Additionally, the prison authorities could engage some private partners in the provision of certain services. This may be in form of outsourcing some vital services like feeding, health care, and so on to viable private institutions who would provide more qualified personnel and expertise in the provision of such facilities. This is of course to be complimented with the voting of more funds to cater for the welfare of inmates in prisons.

Tackling the root causes of elderly crimes like poverty and isolation

Finally, a reduction in elderly crime could be achieved by addressing some of the identified causes of elderly crime like poverty and isolation. The government through its relevant agencies could establish elders' welfare boards to cater for the economic needs of elders. Also, the nation's pension board could be encouraged to settle arrears of retirees' pensions and gratuity. On the other hand, the traditional family ties should be strengthened to encourage younger people (especially urban dwellers) to stay close to their elderly ones. The government could also establish agencies to cater for the social needs of elders. Recreation centers for elders could also be set up in different local government areas. This is capable of proffering solution to the problem of isolation often faced by elders in the society.

Conclusion

In this paper, attempt was made to synergies criminological and gerontological viewpoints in understanding the complexity of ageing and crime, particularly the state of elderly inmates in the Nigerian criminal justice system (prisons). This has been situated in the underlying penal philosophy of the country, which emphasises retribution at the expense of rehabilitation. Consequently, we have placed the needs of elders on the criminological research and policy scheme. From the evidence presented in the literature, more research attention needs to be paid to elderly inmates and the possibility of establishing a geriatric ward in most prisons to cater for their needs. Moreover, since the current development in penology is more of rehabilitation and protection of the rights of inmates, the elderly inmates have their inalienable right to health despite their liberty status, and then the relevant authorities should ensure the well being of these senior citizens.

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BOOK RECEIVED FOR REVIEW

Sunset Years of Life : A Multi-dimensional Study of Rural Elderly by Prafulla Chakrabarti, Published by Urbee Prakashan, 28/5, Convent Road, Kolkata - 700 014. Price Rs. 300/-, pp. 280.

October 1st 2009 - WORLD SENIOR CITIZENS' DAY was celebrated in Umang Day Care Centre, Jhalana Basti, Jaipur by Indian Gerontological Association. At this occasion 15 senior citizens of age 80+ were felicitated by IGA Shri P.S. Mehra, Commissioner and Secretary, Department of Social Justice and Empowerment was the chief guest. Shri Satya Narayan Singh (Retd. I.A.S.) presided the function. Shri R.C. Jain (Retd. R.A.S.), Shri Suresh Vyas (Retd. I.P.S.), Dr. S.C. Prasad (Treasurer, IGA), Shri M.M. Khinchi, Additional Director, Department of Social Justice and Empowerment and others were also present. Approximately 100 senior citizens of the Basti attended the programme. Shri Satyen Chaturvedi, President, R.V.H.A. welcomed all the guests and Dr. K.L. Sharma, Secretary, IGA gave thanks to all the guests and participants.

YOU ARE INVITED TO JOIN US

We are Working to Protect the Rights and Social Welfare of the Elderly

Indian Gerontological Association (Registration No 212/ 1968) is an independent grassroots non-profit organization based in Jaipur (Rajasthan). Our efforts **empower** and **support** the underprivileged elderly in rural and urban communities.

We strive to **ensure social justice and welfare for people over 60**, focusing on those elders who are the most disadvantaged such as elderly women. We protect the civil liberties of elderly citizens as a part of the **struggle for individual rights and social progress** in India.

Currently, the elderly community comprises approximately 10% of the total population of India. This number will increase to nearly 25% within the next twenty years. **Neglected and abandoned by society and sometimes their own families, elders are increasingly subject to conditions of disease and poverty.** They lack access to health care, and often face serious discrimination as well as physical and emotional abuse.

As a public interest group, **we work for and with the elderly to protect their rights and access to a better quality of life.** We seek to both empower and serve by working directly with rural communities. By facilitating the growth of citizen's groups, raising public awareness on aging, promoting public action and participation, and advocating public policy changes, Indian Gerontological Association hopes to alter the current trends in elder relations for the better.

Our work includes :

- ★ **Community Centers for the Elderly** that Offer Communal Support and Interaction
- ★ **Training on Legal Rights** by Offering the Elderly Practical Knowledge on Their Rights
- ★ **Public Hotline for the Elderly** that Offers Legal Referrals and Assistance (proposed)
- ★ **Public Accessibility for the Elderly** Advocating More Available Access to the Public Sphere
- ★ **Use of various forms of media** to Raise Public Awareness on Elder Rights
- ★ **Counselling** and Helping elderly to Relieve Psychological Stress and Depression
- ★ **Elder Women's Cooperatives** that Provide Grants and Assistance to Elderly Women
- ★ **Public Awareness Raising** to Promote Public Action for Helping Disadvantaged Elderly
- ★ **Field Study of Rural Areas** to Analyze Challenges Faced by Aging Rural Population

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