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Kulvir singh
Department of Human
Genetics, Punjabi University,
Patiala, India

S.P. Singh
Department of Human
Genetics, Punjabi University,
Patiala, India

Ginjinder kaur
Department of Human
Genetics, Punjabi University,
Patiala, India

Depression and reaction time among elderly residing in old age homes of Punjab

Kulvir singh, S.P. Singh, Ginjinder kaur

Abstract
The present study was conducted to view the difference in depressive symptom score, audio reaction time and visual reaction time between the elderly residing in old age homes as well as those residing with their families. Cross-sectional of 100 subjects (50 residing old age homes and 50 residing with their families) including only males, age ≥60 years was collected from various districts of Punjab. The mean weight among the elderly living with their families was significantly (p<0.05) greater than those residing in old age homes. The mean depressive symptom score (p <0.001), audio reaction time (p<0.05) and visual reaction time (p<0.05) was observed to be significantly greater among the elderly living in old age homes as compared to those living with their families. It can be concluded that living arrangement of the elderly effect the levels of their i.e. depressive symptom scores of the elderly staying in old age homes was higher as compared to those elderly living with their families. CESD depression questionnaire was found to be reliable for this study. Depressive symptom score and audio and visual reaction time increases significantly with advancing age among the male elderly. Audio and visual reaction time also increases with increasing depressive symptom score.

Keywords: Depression, reaction time, elderly, old age home, Punjab

Introduction
Ageing as defined by WHO, "The lifelong process of growing older at cellular, organ or whole body level throughout the life span"(WHO 2004). The term elderly is used for those individuals aged 60 years and above (WHOM 1995). The ageing of the population all over the country has not only brought with it new and serious issues, but has also become a national and international health matter to be dealt with as in our country.
Worldwide estimated population above 60 years was 737 million in 2009 and is likely to increase to two billion by 2050**.** According to the India Census 2011, the percentage of elderly population above 60 years of age has gone up from 6.0 to 8.0 percent during 1991 to 2011. The states of Kerala, Tamil Nadu, Himachal Pradesh and Punjab had 12.6, 10.5, 10.4 and 9.5 percent 60+ populations respectively. These four states account for highest percentage of elderly population. Singh (2001) studied the ageing trends in Punjab and found that the rate of growth of the 60 plus population (2.81 per cent) in the state is higher than that for the general population (2.10 per cent).
Depression among elderly population is a major health concern, causing adverse effects on health of elderly. Depression is one of the most frequent and disabling mental illnesses and predicted to become the second leading cause of disability worldwide by 2020 (WHO 2004). Depression is a common mental disorder that presents with depressed mood, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy, and poor concentration (WHO). Mental well-being in elderly is as much important for healthy ageing as much important is physical well-being (Johnson et al., 2011). Depression is a leading cause of loss of productivity (Ebmeier et al., 2006) and physical disability among older adults (Barry, 2009). Elderly suffering with depressive symptoms are at increased risk of mortality (Edwards 2009). About 2% of the patients suffering with depression commit suicide (Bostwick and Pankratz, 2000). Improvement in depressive symptoms dilutes the negative effect of cognitive decline (li 2009). Reducing depression and physical disability, both promotes healthy ageing (Jeste 2013).

Correspondence:
Kulvir singh
Department of Human
Genetics, Punjabi University,
Patiala, India

Taware et al. (2012) found that audio, visual and whole body reaction time increase with advancement of age. Significant increase in visual reaction time and auditory reaction time was observed with the advancing age (Chandak and Makwana, 2012). Yu Chen et al. (2012) in his paper about reviewing literature on older people in china concluded that the living arrangements are related to older people's depression.

In India, where the incidence of the public provision of the old age care was less, the family system played a key role in the protection of the old. But in recent changes in occupational structure, migration, urbanization and decline in the family size where adult children do not always live with their parents, the preference for home based care is changing. Jamuna (2003) found that about 2.73% of elderly care in India occurs in institutionalized or formal setting. In the light of these changes, living arrangements of the elderly have emerged as an important area of research. So, there is need to evaluate the health status of elderly living in old age homes and those living with their families.

Objectives

The proposed study was conducted with a view:

- To find out the difference in levels of depressive symptom score between the elderly living in old age homes and those living with their families.
- To find out the difference in audio and visual reaction time between the elderly living in old age homes and those living with their families.
- To find out the relation between depressive symptom score and audio and visual reaction time

Method and materials

In the preset cross-sectional study, the data of 100 subjects (including only males, age ≥60 years) was collected from various districts of Punjab. Out of total subjects, 50 subjects were living in old age homes and 50 were living with their families. Data of age, height, weight, reaction time, depressive symptom score and other general information was obtained for each subject.

Depressive symptoms was measured by Epidemiologic Studies Depression scale (CES-D).The Center for Epidemiologic Studies Depression scale (CES-D) is a short self-report scale designed to measure depressive symptomatology in the general population. It has been developed by Radloff (1977). Beekman et al. (1997) conclude that the criterion validity

of the CES-D was very satisfactory in older adults. A score of 16 has widely been used as a standard threshold indicating possible clinical depression (Radloff, 1977; Weissman et al, 1977; Huba et al, 1995).

Coefficient of Reliability for depression questionnaire in the preset study was tested by filling the depression questionnaire twice for 25 subjects with time interval of one week. To test the internal consistency of depression questionnaire cronbach's alpha was calculated.

Audio and visual reaction time was recorded by using digital reaction time recorder. The device has two control points. One control was hold by the subject and another by examiner. Examiner starts red light signal (for visual reaction time) or sound signal (for audio reaction time) from device by pressing his control. Subject as quickly he can, shut down the signal by pressing his control. Device records the time from starting and shutting down the signal. This time recorded by the device is reaction time.

Results

Table 1 depicts the reliability for depression questionnaire. The Technical error of measurement for CESD depression questionnaire found to be 2.49 and coefficient of reliability was 0.99. Internal consistency coefficient cronbach's Alpha for CESD scale for scoring depression symptoms found to be 0.94.

Figure 1 depicts the mean values among both the groups of elderly. The mean age of the elderly living in old and those living with their families was observed to be 72.5 years and 69.78 yrs, respectively. The height among the elderly living in old age homes was 66.08 kg and among those living with their families was 74.72 kg. Among elderly residing in old age homes mean height was 166.53 cm and among those residing with their families was 167.69 cm. The mean depressive syptom score, audio reaction time and visual reaction time among elderly living in old age homes was 24.2, 0.54 sec and 0.58 sec, respectively. Similarly, among elderly residing with their families mean depressive syptom score, audio reaction time and visual reaction time was 9.02, 0.37 sec and 0.39 sec, respectively.

Table 2 showed the t- values between two groups of elderly. The mean weight among the elderly living with their families was significantly ($p<0.05$) greater than those residing in old age homes. The mean depressive symptom score ($p <0.001$), audio reaction time ($p<0.05$) and visual reaction time ($p<0.05$) was observed to be significantly greater among the elderly living in old age homes as compared to those living with their families.

Table 3 and figure 2, 3,4 depicts the correlations between various variables.There was found to be positive and significant correlation between age and depressive symptom score ($r = 0.30$; $p \leq 0.05$). Age is correlated positively and significantly with audio reaction time($r = 0.28$; $p \leq 0.05$) and visual reaction time($r = 0.36$; $p \leq 0.05$). Depressive symptom score given significant coefficient of correlation with audio reaction time ($r = 0.36$; $p \leq 0.05$) and visual reaction time ($r = 0.45$; $p \leq 0.05$).

Tables and figures

Table 1: TEM for depression questionnaire

	TEM	TEM%	Coefficient of reliability
Depression questionnaire	2.49	9.08	0.99

Table 2: Mean values for various measurements among elderly living in old age homes and elderly living with families.

Measurement		Old age home		Families		t- value
		Mean	±SD	Mean	±SD	
Age(Year)		72.5	±5.41	69.78	±5.62	1.68
Height(cm)		166.53	±5.58	167.69	±5.63	0.72

Weight(kg)		66.08	±10.00	74.72	±13.55	2.68*
Depressive symptom score	24.2	±10.96	9.02	±8.41	5.09*
Audio reaction time(second)	0.54	±0.32	0.37	±0.12	1.99*
Visual reaction time(second)	0.58	±0.32	0.39	±0.11	2.18*

Table 3: Correlation coefficient between various measurements

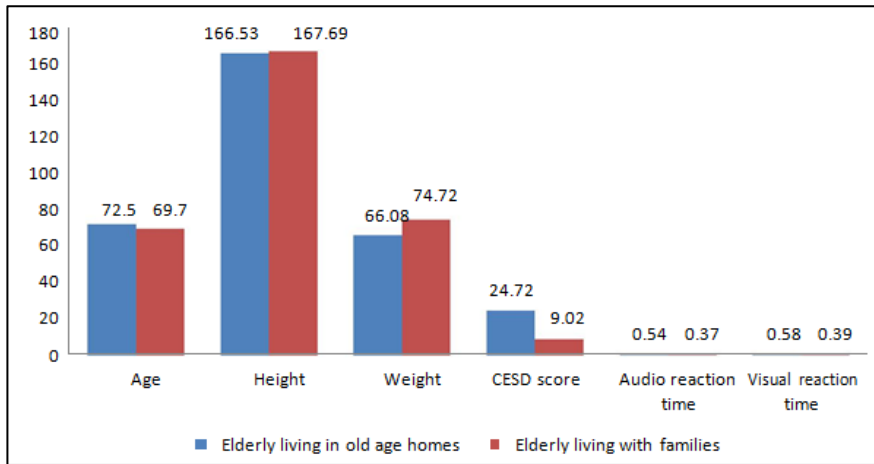| Correlation coefficient	Audio reaction time	visual reaction time	Depressive symptom score
Age	0.28	0.36	0.30
Audio reaction time		0.87	0.36
visual reaction time			0.45

Fig, 1: Mean values for various measurements among elderly living in old age homes and elderly living with families.
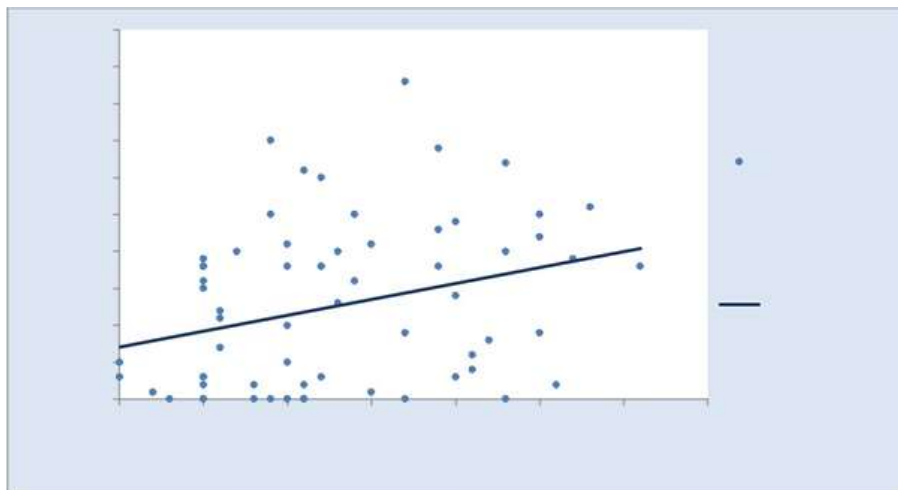

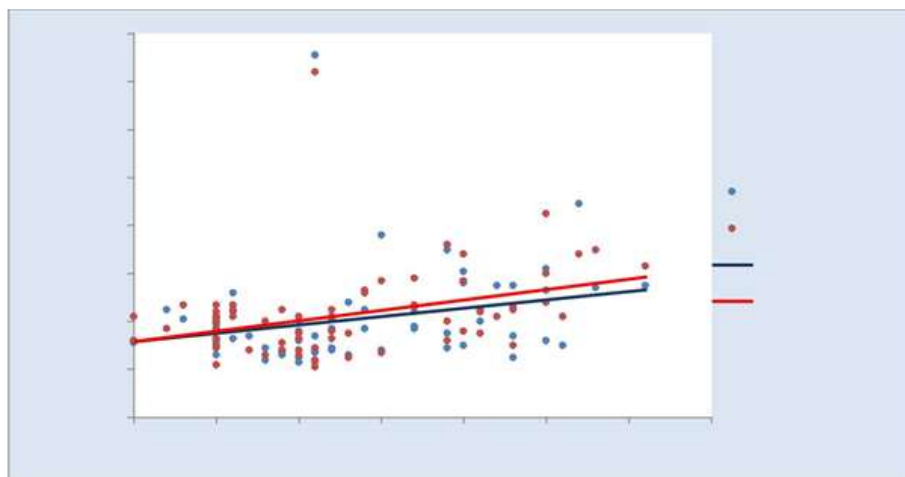**Fig. 2:** Correlation between age and depressive symptom score.

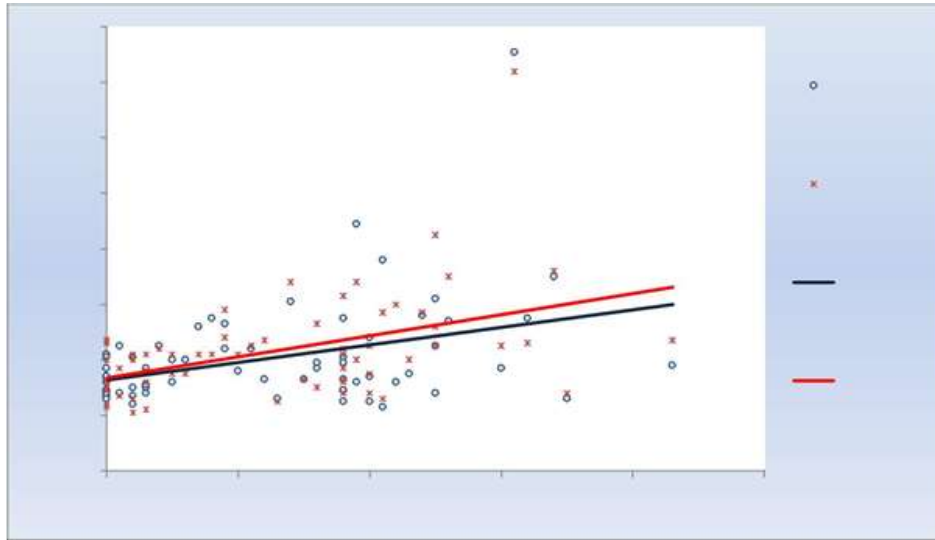**Fig.3:** Correlation between age and audio and visual reaction time.

Fig.4: Correlation between depressive symptom score and audio and visual reaction time.

Conclusion

Technical error of measurement, coefficient of reliability and internal consistency coefficient cronbach's Alpha for CESD depression questionnaire was found to be acceptable. Age of elderly living in old age homes was not significantly but slightly higher than mean age of those elderly living their families. Mean weight of elderly living in old age homes is significantly greater than mean weight of those elderly living with their families. Depressive symptom score for elderly living in old age homes was significantly higher as compared to those living with their families. Mean audio and visual reaction time for elderly living in old age homes was higher significantly higher than those elderly living with their families was 0.39 seconds. There was positive and significant correlation between age and depressive symptom score. Age wass correlated positively and significantly with audio reaction time and visual reaction time. Depressive symptom score given significant coefficient of correlation with audio reaction time and visual reaction time.

From the present study, it can be concluded that living arrangement of the elderly effect the levels of their i.e. depressive symptom scores of the elderly staying in old age homes was higher as compared to those elderly living with their families. CESD depression questionnaire was found to be reliable for this study. Depressive symptom score and audio and visual reaction time increases significantly with advancing age among the male elderly. Audio and visual reaction time also increases with increasing depressive symptom score.

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