Original Article

Psychosocial Determinates of Cognitive Functioning in Older Adults

Tehreem Arshad, Rukhsana Kausar, Iram Fatima

ABSTRACT

OBJECTIVE: To examine the predictors of cognitive functioning in older adults of Pakistan.
METHODOLOGY: A community-based sample of 243 men and women (age range of 50-75) was drawn through convenient sampling by employing a specific inclusion and exclusion criteria from different cities of Punjab province of Pakistan. We employed the co-relational research design. A set of questionnaires to capture the study variables was administered individually after taking into account the ethical considerations. Data was collected from January 2017 to November 2018.
RESULTS: Data was analyzed through Statistical Package for Social Sciences version - 20 (SPSS). It depicted that cognitive functioning is positively associated with education, personality traits of agreeableness, consciousness, and openness, social network of friends and social activity while negative associations were found betweengender, age, neuroticism with cognitive functioning. Regression analysis further showed that age, education, conscientiousness and social activity predict cognitive functioning.
CONCLUSION: Age, education, possessing conscientiousness personality trait and more social activities are found as determinates of cognitive functioning in older adults. Implications of these results are further discussed.

KEY WORDS: Personality, Social engagement, Social activities, Cognitive functioning

This article may be cited as: Arshad T, Kausar R, Fatima I. Psychosocial Determinates of Cognitive Functioning in Older Adults. J Liaquat Uni Med Health Sci. 2020;19(03):208-14.
doi: 10.22442/jlumhs.201930692

INTRODUCTION

Cognitive functioning is the cluster of mental abilities such as learning, memory, thinking, reasoning, problem solving, decision making, and attention[1]. Cognition is a vital element for independent functioning and effective communication. This ability often deteriorates with age and older people exhibit continuum of cognitive abilities including normal abilities, mild impairments, and dementia[2]. Changes in the associated structure of brain areas are likely to be linked with cognitive changes that take place with normal ageing. Mild deficits in memory (like episodic, working and short term memory), executive functioning, speed of processing, and fluid intelligence are all linked to normal process of aging[3]. Cognitive functioning is influenced by different factors such as educational level, personality factors, social engagement etc.

Education is argued to have a strong positive influence on cognitive functioning and higher educational level is posited to lead towards better cognitive functioning even in older age[4-6]. Relevant to older population, numerous research have shown that older people who face cognitive difficulties with passing age mostly have low educational level[7,8].

Another important factor which influences cognitive functioning in older adults is engagement in social activities. Social engagement linked with better mental health of older adults[9]. Literature reveals that older adults who have greater social involvement usually exhibit better cognitive functioning than their less socially-active counterparts[10]. Those who have lower social support and are physically inactive, are more prone to develop dementia and deterioration in executive functioning[11,12]. Increase in involvement in cognitive activities, the rate of cognitive decline got reduced by 52% over 6 years in normal people[13]. Similarly increased engagement in cognitive activity reduce risk of cognitive deterioration[14].

Personality factors are also important determinants of cognitive functioning in older age[15]. The Big Five Factors model explain the structure of personality including: Neuroticism that involves the manifestation of tension and experience of anxiety, anger and depression; Extraversion is related to sociability and liveliness; Openness to experience is associated with creativeness and intellectual interests; Agreeableness, which is related to qualities of trust, altruism and kindness; and finally, Conscientiousness, which refers to endorsement of values[16]. Different researches have shown that different personality factors play different roles in cognitive functioning. For example, neuroticism negatively affects cognitive functioning while high scores on conscientiousness are associated with lower cognitive decline[15,16]. In the same way openness, agreeableness and extraversion is positively associated with cognitive functioning[17,18].

Better cognitive functioning help to be functional in life

and to live life with full zeal and zest. That is why psychosocial determinant of cognitive functioning are important to study. In Pakistan, older adults are a neglected section of society[19] and they do not get much opportunity to engage in social activities contributing to isolation. Along with this, the deterioration in their physical strength and psychological capital make their life more problematic and it ultimately affects their quality of life. In Pakistan, work has been done on domains such as quality of life, lifesatisfaction andsocial support in older population etc. To the best of the researcher's knowledge, no study has examined the predictors of cognitive functioning with these variables in older adults in Pakistan. So the study is aimed at determining the factors that play important role in cognitive functioning that will further help older adults in becoming socially productive individual. Findings of this study will help to elucidate such factors that help in promoting cognitive functioning. Psychologists and community workers can use our results to promote the identified factors. The research objectives were 1) to examine the relationship among personality traits, social engagement and cognitive functioning in older adults 2) to examine the predictors of cognitive functioning in older adults.

METHODOLOGY

Present study employed the correlational research design. Sample comprised of 243 older adults recruited through convenient sampling from different cities of Punjab province, Pakistan. Sample was community-based individuals residing in home setting. Sampling followed a specific inclusion and exclusion criteria such as we included individuals falling in the age range of 50-75 years, who could comprehend and communicate in Urdu language. Participants were excluded if they had dementia; any chronic psychiatric illness or an acute episode of major depression; hearing, visual and/orphysical impairment; or were residing in old homes. We collected data from January 2017 to November 2018. According to WHO, the criteria for elderly age varies between developed and developing countries[20]. Therefore, the upper and lower limits of age were revised to 50-75 years considering the status of Pakistan as a developing nation, its low life expectancy, and the unique aspects associated with ageing in this culture.

We took permission from authors of assessment measures (listed below) used in the study. All measures were administered in Urdu after translation where needed and were individually-administered.

Cognitive functioning of the participants was assessed with Montreal Cognitive Assessment Scale (MoCA) by Nasreddine et al[21]. This tool helps in differentiating between older people suffering from dementia and those whose cognitive abilities are intact. It measures 7 cognitive domains: orientation, attention and calculation, abstraction, language, recall, visuo-spatial function and executive function[22].

Social engagement is maintenance of social connections and participation in social activities[9]. Previous researches have measured social engagement by employing three measures as: frequency of participation in social activities,social network size and social support[23]. We also followed the same method.

(i)Participation in Social Activistes [(PSA) ; Krueger KR et al[23]. In the present study participation in social activities was assessed using multiple questions. For the assessment of social activities different questions were developed[24]. Based on it, six questions on broad themes related to social activities were formulated[23]. In the present study, participants had to mention the frequency of participation in social activity by indicating how often during the past year, they engaged in six common types of activities involving social interaction (1: go to restaurants, sporting events; 2: go on day trips or overnight trips; 3: do unpaid community/volunteer work; 4: visit relatives' or friends' houses; 5: participate in groups, (baithak, daira) 6: attend religious services(Millad, daras). Others (attending weddings, birthdays) etc.

(ii)The Lubben Social Network Scale [(LSNS); Lubben JE 2000][25]. LSNS was employed in the present study to assess social network of the participant. It was originally developed in 1988 and was revised in 2002. The LSNS assesses the size of the respondent's active social network (i.e. relatives or friends, neighbors) and perceived support[25].

(iii)Life Time Cognitive Activity Scale [(LTCAS); Wilson, Barnes, & Bennett, 2013][26]. In the present study participation in cognitively stimulating activities was assessed through Life Time Activity Scale. It is a self-report assessment of lifelong frequency of participation in cognitive stimulating activities. It comprises of items about frequency of participation in cognitive activities across the life span including specific time points of 6 years, 12, 18, 40 and present age.

(iv)Big Five Inventory[(BFI); Kovaleva A, Beierlein C, Kemper CJ, Rammstedt B 2013][27].

Big Five Inventory was used for assessment of personality. It consists of 21 items based on five domains as: extraversion, agreeableness, conscientiousness, neuroticism and openness.

(v)Mental Health Screening Questionnaire [(MHSQ); Mirza M 2008][28]. This tool was employed to screen the sample and to assist in the exclusion of sample with co-morbid physical or mental conditions**.** It is a 5-item checklist and each item relate to one clinical disorder such as anxiety, depression, obsessive- compulsive disorder, schizophrenia and general health.

Demographic and Chronic Conditions Related Information Sheet: Demographic information such as gender, age, education, marital status, family system,

occupation, monthly income, etc. was inquired from participant through this sheet. Checklist for Chronic Conditions was devised for screening of exclusion criteria.

Procedure

Ethical Considerations for the present study were fully ensured as per American Psychological Association (APA). The data collection was initiated after taking approval from Departmental Doctoral Programme Committee (DDPC) and Advanced Studies Research Board (ASRB) of University of the Punjab, Lahore. Research participation was voluntary, and participants were informed that they have right to withdraw from the research at any point in time. First, pilot study was carried out on 10 individuals to test the feasibility of the study, comprehension and conceptual clarity of the questions as well as to determine the average time needed for administrations. During pilot study many significant observations were made, and modifications in questionnaire and procedure were done based on the feedback from the pilot study. Potential participants were approached in community. After ensuring all the ethical considerations, the set of questionnaire was administered on willing participants. On average participants took 30-40 minutes to fill the questionnaires.

RESULTS

Data analysis was done using statistical package for social sciences version - 20 (SPSS). After initial screening, preliminary analysis,descriptive statistics and inferential statistics such as Pearson Product Moment Correlation and Regression Analysis were run.

Table I depicts the frequency and percentages of demographic characteristics of the participants. There was almost equal presentation of both genders in the sample. Majority participants had education level of matriculation (Class 10) to intermediate (Class 12). By profession most of the male participants were either businessman or were engaged in blue-collar jobs, whereas majority of the female participants were housewives (Table I)

Correlation analysis showed that education, personality traits of agreeableness, conscientiousness and openness, social network of friends, social and cognitive activity at present have significant positive correlation with cognitive functioning while gender, age and neuroticism have negative correlations with the cognitive functioning highlighting that males have better cognitive functioning as compare to females (Table II).

Hierarchical regression analysis was applied to find predictors of cognitive functioning. The demographic covariates that had significant correlation with cognitive functioning were entered in first model of regression: age, education, gender. In step 2, main predictors such as personality factors, social engagement, social network, social activities, and present participation in cognitive activities were entered. Assumptions of independence of error was tested (Durbin-Watson) with cut-off value of 1.8, thus it fulfilled.

TABLE I: FREQUENCY AND PERCENTAGES OF DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

Variables	*f*	*%*
Gender		
Male	117	41.1
Female	126	51.9
Education		
Illiterate	24	9.9
Less than primary	04	16
Primary	25	10.3
Middle	33	13.5
Matric	62	25.5
FA	44	18.1
BA	31	12.8
MA	17	07
MPhil	03	1.2
Occupation		
Bank	01	0.4
Businessman	30	10.44
Gov. employee	19	8.0
Housewife	97	39.9
Teacher	12	4.6
Retired	06	2.4
No job	06	2.4
Miscellaneous		
Low paid job	30	17.90
Spiritual teacher	02	0.8
Missing	24	9.9

As shown in Table III, Model 1 was statistically significant: F (3, 239) =28.36, p<.001, and accounted for 26% of variance in cognitive functioning. Education emerged as a significant positive predictor of cognitive functioning, while age negativelypredicted cognitive functioning. Model 2 was also statistically significant: F (13, 229) = 10.54, p<.001, and accounted for an additional 11% of variance in cognitive functioning

TABLE II: CORRELATION AMONG DEMOGRAPHIC, PERSONALITY TRAITS, SOCIAL ENGAGEMENT AND PARTICIPATION IN COGNITIVE ACTIVITIES WITH COGNITIVE FUNCTIONING (N=243)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	M	SD
1.Age	1	.05	-.14*	.01	-.00	-.05	-.07	.120	-.09	-.09	.004	.022	.08	-.18**	56.53	8.07
2.Education		1	-.10	-.00	.12	.02	-.14*	.20**	.113	-.09	.16**	.26**	.30**	.47**	9.45	4.45
3.Gender			1	-.04	-.05	.005	.13*	-.12	-.01	-.03	-.23**	-.13*	-.05	-.12*	.51	.50
4. Extraversion				1	.12	.28**	-.12*	.33**	.07	.16*	.16*	.14*	.06	.03	12.44	2.11
5.Argreeableness					1	.06	-.03	.15*	.04	.07	.114	.110	.054	.18**	13.48	3.18
6.Conscientiousness						1	-.23**	.40**	.122	.09	.14*	.09	.101	.27**	13.62	2.93
7.Neuroticism							1	-.102	-.17**	-.11	-.09	-.09	-.22**	-.14*	11.20	3.19
8.Openness								1	.109	.012	.16**	.19**	.16*	.20**	14.36	2.83
9.Relative network									1	.41**	.49**	.26**	.120	.101	14.12	6.56
10.Neighbor network										1	.49**	.28**	.115	-.007	12.31	6.52
11.Friend network											1	.46**	.18**	.19**	11.31	7.17
12 Social activity												1	.34**	.29**	16.65	6.25
13. CAS present													1	.25**	10.08	5.24
14.Cognitivefunctioning														1	21.10	4.80

Note: M= mean; SD= standard deviation, where Gender coded as male= 0, Female =1

TABLE III: HIERARCHICAL REGRESSION ANALYSIS PREDICTING COGNITIVE FUNCTIONING IN OLDER ADULTS FROM DEMOGRAPHIC COVARIATES PERSONALITY, SOCIAL ENGAGEMENT AND PARTICIPATION IN COGNITIVE ACTIVITIES

Predictors	Cognitive functioning	
	Step 1	Step 2
Constant	24.13	17.62
Age	-.18*	-.19*
Education	. 45***	.36***
Gender	-.10	-.08
Personality		
Extraversion		-.06
Agreeableness		.01
Conscientiousness		
Neuroticism		-.02
Openness		-.00
Social Network		
Relative		-.03
Neighbour		-.07
Friends		.04
Social activity		.14*
Cognitive Activity-present		.07
ΔR^2	.26***	.11***

after controlling for Model 1. Age, education, conscientiousness and social activity were significant predictors of cognitivefunctioning, while social network (relative, neighbors and friends) and cognitive activity at present did not predict cognitive functioning (Table III).

DISCUSSION

The present study was planned to examine psychosocial predictors of cognitive functioning in older adults. Unique to our study, the construct of social engagement was studied thoroughly rather than just bits of social participation.

Results showed that education, personality traits of agreeableness, conscientiousness, openness, social network of friends, social activity and cognitive activity at present have significant positive relationship with cognitive functioning. Age and neuroticism were shown to have negative relationship with cognitive functioning while being a female is negatively associates with cognitive functioning. These findings are consistent with the existing literature showing education has positive correlation with cognitive functioning[4,5] while age is negatively associated with cognitive functioning[29]. Education gives individual the opportunity to engage in cognitively stimulating activities. In addition, individual with higher education are also likely to engage in jobs that are stimulating for the mind. These experiences, perhaps, protects individuals against cognitive decline during the old age.

Contradictory findings exist about cognitive performance of men and women. Few studies suggest cognitive functioning of women is poor[29]. In the present research, although there is association exist in correlation but gender did not predict cognitive functioning. Present finding are also in line with previous research[30].

As mentioned, among the personality traits neuroticism had negative correlation with cognitive functioning and conscientiousnessled to lower cognitive decline as supported in existing literature[15,17].

Research also substantiates the positive role of social engagement in cognitive functioning[10]. Individuals with a wider social network get more opportunity to engage in cognitively stimulating conversations and activities, which then also lead to increase in social network. Existing literature also support the finding of the present study that more involvement in cognitive stimulation activities link with better cognitive functioning[13].

Those individuals possessing social network of friends and participating in social and cognitive activates have better cognitive functioning. Such personality traits and activities help them to be functional in life, utilize their capacities which reflects in better cognitive function**.** Thus we can promote such trends that help in acquiring better cognitive functioning rather than on path of decline.

Major aim of the present study was to find out the predictors of cognitive functioning. Findings of regression analysis showed that education, conscientiousness and social activity turned out to be significant positive predictors of cognitive functioning. While age turned out to be negative predictor. Education was found as significant positive predictors of cognitive functioning. Higher education is associated with better cognitive functioning[29]that shows consistency with present research. Age was resulted as a negative predictor. Previous researches also support that as age increases, the cognitive functioning starts to deteriorate and younger people perform better on cognitive functioning tasks[29,31-32].

In the present research consciousness turned to be positive predictor of cognitive functioning. Individuals who are high in conscientiousness possess trait of organized, dutifulness, achievement striving (thorough) self-discipline[33] are likely to have better cognitive functioning. Social activity also emerged as positive predictor of cognitive functioning. It shows consistency with previous research that found out social involvement having protective influence on cognitive functioning among elderly[34].

In this research social network (relative, neighbors and friends) and cognitive activity at present did not turn out as predictors of cognitive functioning. This finding was contradictory to expectation as literature suggest social network affect cognitive functioning[10,13].

In the present research, as compared to social network, participation in social activities played a more vital role in cognitive functioning. Thus experiencing the phenomena of social participation is more meaningful as compared to just the availability of a large social network. There were also small to modest correlations was found between social network of neighbors, family and friend, which suggests that having more friends, neighbors and family member that a person considers a part of his network does not necessarily translate into engagement in social activity. In the present research, only one aspect of social engagement was seen to be important for cognitive functioning. Future studies should examine this longitudinally to confirm the role of social engagement and its aspects as buffers.

CONCLUSION

In the light of finding of present study it can be concluded that age, education, conscientiousness and social activity turned to be significant predictors of cognitive functioning. This implicates that getting more education, having conscientiousness traits and participating in social activities can help to safe guard cognitive functioning in older adults. Participation in such activities that involve social gathering can be a powerful tool in promoting better cognitive functioning of older adults that eventually results in better quality of life.

Ethical permission: Institute of Applied Psychology, University of The Punjab. ERC letter No. D/87/IAP dated: 20-01-2020.

Conflict of Interest: Authors of study has no conflict of interest to declare

Funding: No funding received from any source

AUTHOR CONTRIBUTIONS

Arshad T: Conceived the study, data collection, analysis and writing
Kausar R: Conception and preparation of study
Fatima I: Data analysis & preparation

REFERENCES

1. Fisher GG, Chacon M, Chaffee DS. Theories of Cognitive Aging and Work. In: Work Across the Lifespan. 2019; p.17-45. Academic Press. doi:10.1016/B978-0-12-812756-8.00002-5.
2. Bennett DA, Wilson RS, Schneider JA, Evans DA, Beckett LA, Aggarwal NT, et al. Natural history of mild cognitive impairment in older persons. Neurology. 2002; 59(2):198-205. doi: 10.1212/ wnl.59.2.198.
3. Rodrigue KM, Kennedy KM. The cognitive consequences of structural changes to the aging brain. In: Handbook of the psychology of aging. 2011; p. 73-91. Academic Press.
4. Weber D, Skirbekk V. The Educational Effect on

Cognitive Functioning: National versus individual educational attainment. IIASA Interim Reports. IIASA, Laxenburg, Austria; IR-14-008. 2014.
5. Maclay K. More Education Linked to Better Cognitive Functioning in Later Life. Berkeley News. [Internet]. 2017; Available from: https:// news.berkeley.edu/2017/08/23/more-education-linked-to-better-cognitive-functioning-later-in-life/.
6. Pengpid S, Peltzer K, Susilowati IH. cognitive functioning and associated factors in older adults: results from the Indonesian family life survey-5 (IFLS-5) in 2014-2015. Curr Gerontol Geriatr Res. 2019; 7: 1-7. doi:10.1155/2019/4527647.
7. Lenehan ME, Summers MJ, Saunders NL, Summers JJ, Vickers JC. Relationship between education and age related cognitive decline: A review of recent research. Psychogeriatrics. 2015; 15(2): 154-62. doi: 10.1111/psyg.12083.
8. Bento-Torres NV, Bento-Torres J, Tomás AM, Costa VO, Corrêa PG, Costa CN, et al. Influence of schooling and age on cognitive performance in healthy older adults. Braz J Med Biol Res. 2017; 50(4): e5892. doi: 10.1590/1414-431X20165892.
9. Mackenzie CS, Abdulrazaq S. Social engagement mediates the relationship between participation in social activities and psychological distress among older adults. Aging & Mental Health. 2019. doi:10.1080/13607863.2019.1697200.
10. Seeman TE. Health promoting effects of friends and family on health outcomes in older adults. Am J Health Promot. 2000;14(6):362-70. doi: 10.4278/0890-1171-14.6.362.
11. Yaffe K, Barnes D, Nevitt M, Lui LY, Covinsky K. A prospective study of physical activity and cognitive decline in elderly women: women who walk. Arch Intern Med. 2001; 161(14): 1703-8. doi: 10.1001/archinte.161.14.1703.
12. Fratiglioni L, Wang HX, Ericsson FL, Maytan M, Winblad B. Influence of social network on occurrence of dementia: a community-based longitudinal study. Lancet. 2000; 355 (9212): 1315 -9.
13. Wilson RS, Barnes LL, Aggarwal NT, Boyle PA, Hebert LE, De Leon CM, et al. Cognitive activity and the cognitive morbidity of Alzheimer disease. Neurology. 2010; 75(11): 990-6.
14. Wilson RS, De Leon CF, Barnes LL, Schneider JA, Bienias JL, Evans DA, et al. Participation in cognitively stimulating activities and risk of incident Alzheimer disease. Jama. 2002; 287(6): 742-8.
15. Sutin AR, Stephan Y, Luchetti M, Terracciano A. Five-factor model personality traits and cognitive function in five domains in older adulthood. BMC geriatrics. 2019; 19(1): 343.
16. Chardosim NM, Oliveira CR, Lima MP, Farina M, Gonzatti V, Costa DB, et al. Personality factors and cognitive functioning in elderly with Parkinson's disease. Dement Neuropsychol. 2018; 12(1): 45-53.
17. Chapman B, Duberstein P, Tindle HA, Sink KM, Robbins J, Tancredi DJ, et al. Personality predicts cognitive function over 7 years in older persons. Am J Geriatr Psychiatry. 2012; 20(7): 612-21. doi: 10.1097/JGP.0b013e31822cc9cb.
18. Weinstein G, Elran Barak R, Schnaider-Beeri M, Ravona-Springer R. Personality traits and cognitive function in old-adults with type-2 diabetes. Aging Ment Health. 2019; 23(10): 1317-25.
19. Ashiq U, Asad AZ. The rising old age problem in Pakistan. J Res Soc Pak. 2017; 54(2): 325-33.
20. Organization WH. Proposed working definition of an older person in Africa for the MDS Project. World Health Organization. 2001; Available from: https:// www. who.int/healthinfo/ survey/ ageingdefnolder/en/.
21. Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, et al. The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. J Am Geriatr Soc. 2005; 53(4): 695-9.
22. Alagia-krishnan K, Bhanji RA, Kurian M. Evaluation and management of oropharyngeal dysphagia in different types of dementia: a systematic review. Arch Gerontol Geriat. 2013; 56 (1): 1-9.
23. Krueger KR, Wilson RS, Kamenetsky JM, Barnes LL, Bienias JL, Bennett DA. Social engagement and cognitive function in old age. Exp Aging Res. 2009; 35(1): 45-60.
24. Mendes de Leon CF, Glass TA, Berkman LF. Social engagement and disability in a community population of older adults: The New Haven EPESE. Am J Epidemiol. 2003; 157(7): 633-72.
25. Lubben JE, Gironda MW. Social support networks. In: Osterweil D, Brummel-smith K, Beck JC (Eds.), Comprehensive geriatric assessment. 2000: 121-37. New York, NY: McGraw Hill.
26. Wilson RS, Barnes LL, Bennett DA. Assessment of lifetime participation in cognitively stimulating activities. In: Cognitive Reserve. 2013; pp. 173-186. Psychology Press.
27. Kovaleva A, Beierlein C, Kemper CJ, Rammstedt B. Psychometric properties of the BFI-K: A cross-validation study. Int J Educ Psychol Assess. 2013; 13(1): 34-50.
28. Mirza M. Development of the perceived expressed emotions scale and its illustration on the patients with schizophrenia, ocd and depressive illness. 2008 (Doctoral dissertation, university of the Punjab, Lahore, Pakistan). Available from: https:// prr.hec.gov.pk/jspuri/ handle/123456789/6237.
29. Guerrero Berroa E, Ravona Springer R, Schmeidler J, Silverman JM, Sano M, Koifmann K, et al. Age, gender, and education are

associated with cognitive performance in an older Israeli sample with type 2 diabetes. Int J Geriatr Psychiatry. 2014; 29(3): 299-309.
30. Aartsen MJ, Martin M, Zimprich D. Gender differences in level and change in cognitive functioning. Gerontology. 2004; 50(1): 35-8.
31. Yaffe K, Fiocco AJ, Lindquist K, Vittinghoff E, Simonsick EM, Newman AB, et al. Predictors of maintaining cognitive function in older adults: the Health ABC study. Neurology. 2009; 72(23): 2029 -35.
32. Paúl C, Ribeiro O, Santos P. Cognitive impairment in old people living in the community. Arch Gerontol Geriat. 2010; 51(2): 121-4.
33. John OP, Srivastava S. The Big Five trait taxonomy: History, measurement, and theoretical perspectives. Handbook of personality: Theory Res. 1999; 2: 102-38.
34. Crooks VC, James Lubben, Diana B Petitti, Deborah Little, Vicki Chiu. Social network, cognitive function, and dementia incidence among elderly women. Am J *Public Health*. 2008; 98(7): 1221-7.

AUTHOR AFFILIATION:

Tehreem Arshad *(Corresponding Author)*
Institute of Applied Psychology
University of the Punjab
Lahore, Punjab-Pakistan.
Email: tehreem.ccpsy@pu.edu.pk

Dr. Rukhsana Kausar
Institute of Applied Psychology
University of the Punjab
Lahore, Punjab-Pakistan.

Dr. Iram Fatima
Institute of Applied Psychology
University of the Punjab
Lahore, Punjab-Pakistan.