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Cognitive Functioning among Elders with Symptoms of Depression: The Case of Two Selected Institutionalized Care Centers in Addis Ababa, Ethiopia

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Abstract

Objectives: Old age is accompanied by different forms of physical and psychological problems. This study aimed to investigate cognitive functioning among elders with symptoms of depression.

Methods: This study employed a cross-sectional descriptive survey. In this study, 116 participants were purposefully selected out of 148 elders from two institutionalized care centers in Addis Ababa with inclusive criteria. The instruments of data collection were GDS-15 and MMSE. Mean, Standard deviation, t-test, ANOVA and Pearson correlation coefficient were used as methods of data analysis.

Results: This study showed that the elders had high rate of depression (68.1%). In addition, 87.1% of elders had declined cognitive functioning. Similarly, the study indicated that there was statistically significant inverse relationship between depression and cognitive functioning ($r=-0.48, p<0.01$). Elders without partners had manifested higher symptoms of depression.

Conclusion: The finding revealed that depression and cognitive decline were higher among the elders. Females had lower cognitive functioning compared to their male counterparts. An increased age and lower level of literacy were associated with lower cognitive functioning and higher symptoms of depression and the married elders had higher score in MMSE compared to others. We suggest that further research is needed to be conducted on non-institutionalized elders.

Keywords: Depression; Cognitive; Geriatric

and old age are often used interchangeably referring to people who are 60 and above [1,2]. The old age starts in the sixties [1]. However, others contended that the period of old age includes people with the age of 65 and above. So, there is no clear demarcation points concerning the period of old age [3].

However, the UN defines aging in relation to people whose age is 60 years and above [4]. This definition has gained acceptance in the Ethiopian context as it coincides with the country's official retirement age [2]. Hence, in this study, terms elderly and older people are, therefore, used interchangeably referring to all people aged 60 and above. United Nation's Statistical report indicated that 962 million people, 13% of the global population, were estimated to be 60 and above [4]. In Ethiopia, there were more than 4.2 million elders in 2013 [5]. This figure is projected to 5.2 million by the year 2020 [6].

Old age is highly accompanied by various forms of physical and psychological problems compared to other stages of development [7-9]. Similarly, depression and anxiety are among the commonly reported psychological problems among the elders [10]. Accordingly, this paper aimed at investigating the cognitive functioning among elders with symptoms of depression. Depression is ranked as the fourth leading cause of disability worldwide and the organization projected that by 2020 it will be the second leading cause of death [11].

According to the WHO, more than 300 million people throughout the world suffer from depression [12]. Almost one in every four-elderly people, for example, suffers from serious cognitive decline, which is a major risk factor for later development of dementia [13,14]. Moreover, depression symptoms are prominent condition amongst older people, with a significant impact on the well-being and quality of life. Scholars clearly depicted that the prevalence of depressive symptoms increases with age and often accompanied by declined cognitive functioning among elders [15-17]. Depressive symptoms are not lone indicators of psychological well-being but are also recognized as significant predictors [16]. Researchers have witnessed that, generally Africa, specifically; Ethiopia is characterized by famine, drought, disease and civil conflicts. These factors substantially decrease coping skills among the elderly [7].

Introduction

Old age is defined in different ways by different groups, societies and countries. Terms such as elderly, older person

Depressive illnesses are among the most prevalent form of psychological problems in Ethiopian communities, affecting people of all ages, socioeconomic classes and educational levels. Relatively few Ethiopians who experience symptoms of depression seek professional help [18]. There were various studies conducted on geriatric depression and cognitive functioning in different parts of the world. However, in Ethiopia, there are no clearly documented data on this issue. Therefore, this study attempted to fill this gap by studying the prevalence of geriatric depression and cognitive impairment among institutionalized elders in Addis Ababa. In addition, the variables were investigated across different socio-demographic variables.

Methods

Study design and area

The study design was a cross-sectional descriptive survey. The study tried to investigate elder's cognitive functioning with symptoms of depression. The elders were aged 60 and above. They were chosen from two institutionalized care centers in Addis Ababa, Ethiopia, namely; Kaliti Institutional Care Center for the Elderly (KICCE) and Kibre Aregawuyan Migbare Senay Direjit (KAMSD).

Inclusion and exclusion criteria

The elders were selected based on the following inclusion/exclusion criteria. The inclusion criteria included elders who were: a) aged of 60 and above, b) willing and able to give their consent, c) had no major other psychiatric disorder, d) had no significant sensory and/or language impairments and e) did not participate in the pilot study. On the other hand, participants those who did not met the inclusion criteria were automatically excluded.

Sampling and participants

The participants of the study were selected by using purposive sampling technique. Out of total of 148 elders, 116 elders who fulfilled the inclusion criteria were selected. Sixty-eight of them (58.62%) were male and the remaining 48 (41.37%) were female.

Instruments of data collection

The instrument of data collection for depression was Geriatric Depression Scale (GDS-15). The scale is valid and reliable, even across cultures [19,20]. The sensitivity of the instrument was 0.97, the specificity was calculated to be 0.95 and the Cronbach's alpha was 0.80 [21]. A pilot test was conducted on 15 participants and the reliability of Cronbach alpha of 0.84 was obtained. The scale contains 15 Yes/No items. In GDS, a score of 0-9 is considered normal, 10-19 indicate mild depression and a score of over 20 is suggestive of severe depression.

Similarly, Mini Mental State Examination (MMSE) contains 12 items and it was used to measure cognitive functioning of

the elders. Folstein et al. reported that for samples of psychiatric patients, at least, the reliability of the instrument was found to be more than 0.82 [22].

Method of data analysis

Quantitative data analysis was used by using SPSS.21. In order to assess prevalence of depression and cognitive functioning and to investigate the relationship between depression and cognitive functioning, descriptive statistics (mean, standard deviation, Pearson correlation and frequency distribution) were used. In addition, inferential statistics (t-test and one-way ANOVA) were used to measure mean differences of depression and cognitive functioning across demographic variables.

Results

As we can see from **Table 1**, majority of the participants 68 (58.6%), were male whereas 48 (41.4%) of them were females. In terms of age, nearly half of the elders (44.8%) were between 60-74 years of age and the remaining portion is occupied by elders above 75 years. Besides, more than half of the participants who accounted for 52.6% (61) were illiterates. With regard to the distribution of marital status, the widowed accounted for the highest number, 42 (36.2%) followed by those elders who were married 39 (33.6%).

Table 1 Socio-demographic background of participants.

Socio-demographic variables	Classifications	Frequency	Percent
Age	60-74	52	44.8
	75-84	31	26.7
	85 and above	33	28.4
	Total	116	100
Gender	Male	68	58.6
	Female	48	41.4
	Total	116	100
Educational background	Illiterates	61	52.6
	Primary	45	38.8
	High School	10	8.6
	Total	116	100
Marital status	Married	39	33.6
	Single	9	7.8
	Divorced	26	22.4
	Total	116	100

Table 2 shows that, more than half of the elders 59 (50.9%) had mild depressive symptoms and 20 (17.2%) of the elders had severe depressive symptoms. The remaining 37 (31.9%) of elders were normal in terms of depressive symptoms.

Concerning level of cognitive functioning, nearly half of the elders 53 (45.7%) had moderate level of declined cognitive functioning followed by elders having mild declined functioning 38 (32.8%). In contrast, 8.6% of the elders had severe declined cognitive functioning.

Table 2 The prevalence of depression and declined cognitive functioning.

Variables	Levels	Frequency	Percent
Depression symptoms	Normal	37	31.9
	Mild	59	50.9
	Sever	20	17.2
	Total	116	100
Cognitive functioning	Normal	15	12.9
	Mildly declined	38	32.8
	Moderately declined	53	45.7
	Severely declined	10	8.6
	Total	116	100

Table 3 shows that elders with mild and severe form of depression had 16.23 mean score of MMSE and elders without depressive symptoms mean score was 24.20. This implies that those elders who were positive in depression had manifested moderate decline in cognitive functioning than those elders having no (less) symptoms of depression.

Table 3 The mean scores of cognitive functioning among elders with positive and negative symptoms of depression.

Symptoms	Total	Percent	Mean score of MMSE
Positive (mild/severe)	79	68.10	16.23
Negative (normal/not risky)	37	31.90	24.20
Total	116	100	

Pearson correlation coefficient was calculated and the result showed that there is a significant moderately negative ($r=-0.477$) relationship between depression and cognitive functioning. It implies that, when depression increases, cognitive functioning decreases moderately (**Table 4**).

Table 4 Correlations between GDS-15 and MMSE.

Variables	Depression
Depression	1
Cognitive Functioning	-0.48**
**p<0.01 level (2-tailed)	

A t-test was calculated to know if there was difference in depression between male and female participants. The result showed that there was no statistically significant difference in

depression between male and female elders, $t=-1.533$, $df=114$, $p>0.05$ (**Table 5**).

Table 5 Depression and gender.

Variable	Groups	N	M	SD	Df	t	Sig.
Gender	Male	68	5.62	2.921	114	-1.533	0.128
	Female	48	6.52	3.408			
M: Mean; SD: Standard Deviation; DF: Degree of Freedom							

To check gender difference in cognitive functioning among elders, a t-test was computed. The result of data analysis indicated that there was a statistically significant difference between male and female elders $t=2.848^*$, $df=114$, $p^*P<0.05$. This implies that, relatively male elders have higher cognitive functioning than female elders (**Table 6**).

Table 6 Gender and cognitive functioning.

Variables	Groups	N	M	SD	Df	t	Sig.
Gender	Male	68	19.57	5.516	114	2.848*	0.005
	Female	48	16.6	5.55			
*P<0.05. M: Mean; SD: Standard Deviation ; DF: Degree of Freedom							

The statistical analysis disclosed that, there was a statistically significant difference ($F(2,113)=5.115$, $P<0.05$) among elders at all age groups. Post-hoc Tukey comparison was computed and the result showed that elderly aged 60-74($M=5.20$, $SD=2.974$) statistically differed from elderly aged 84 and above ($M=7.06$, $SD=2.904$) in depression. This means, elderlies aged 84 and above were more depressed compared to the rest (**Table 7**).

Table 7 Comparison of depression symptoms across age, education and marital status.

Variables		SS	Df	MS	F	Sig.
Age	Between groups	94.39	2	47.19	5.11*	0
	Within groups	1042.6	113	9.22		
	Total	1136.99	115			
Educational	Between groups	141.96	2	70.98	8.06*	0
Background	Within groups	995.02		8.8		
	Total	1136.99	115			
Marital status	Between groups	237.41	3	79.14	9.85*	0

	Within groups	899.57	112	8.03		
	Total	1136.99	115			

*P<.05, SS: Sum Squares; MS: Mean Square; Df: Degree of Freedom

Accordingly, **Table 8** shows that there was a statistically significant difference, $F(2,113)=8.061, P<0.05$) among elderly with different educational background. Accordingly, the post hoc comparison indicated that elders who were illiterate ($M=7.02, SD=2.941$) had higher level of depression symptoms compared to those who attained primary school level ($M=4.69, SD=2.75$). However, there was no significant difference among other educational levels.

Table 8 Comparison of cognitive functioning across age, education and marital status.

Variables		SS	Df	MS	F	Sig.
Age	Between groups	399.295	2	199.648	6.765*	0.002
	Within groups	3334.912	113	29.512		
	Total	3734.207	115			
Educational	Between groups	1041.297	2	520.648	21.847*	0
	Within groups	2692.91	113	23.831		
	Total	3734.207	115			
Background	Between groups	407.01	3	135.67	4.567*	0.005
	Within groups	3327.197	112	29.707		
	Total	3734.207	115			
Marital status	Between groups	407.01	3	135.67	4.567*	0.005
	Within groups	3327.197	112	29.707		
	Total	3734.207	115			

*P<0.05, SS=Sum Squares, MS=Mean Square, DF=Degree of Freedom

Besides, there was a statistically significant difference, $F(3,112)=9.853, P<0.05$) in depression symptom across elderly who were married, single, divorced and widowed. Particularly, the post hoc analysis displayed that elders who were married had lower depression symptoms compared to the divorced and widowed elders.

The above table shows that, there is statistically significant difference in cognitive functioning among the elders in terms of age, educational background and marital status. Accordingly, the above table revealed that there is significant difference among elders in cognitive functioning across all age groups, $F(2,113)=6.765, P<0.05$. A post hoc analysis displayed that cognitive functioning of elders aged 60-74 ($M=20.38, SD=5.424$) significantly differed from those aged 75-84 ($M=17.03, SD=6.074$) and those aged 85 and above ($M=16.36, SD=4.769$). But those aged 75-84 did not differ significantly

from other groups. It was also indicated that elderly aged 60-74 were had higher cognitive functioning than the rest.

As we can see from the above table, there is statistically significant difference in cognitive functioning among all levels of education, $F(2,113)=21.847, P<0.05$). This implies that elders who were illiterate relatively had more declined cognitive functioning than the other groups. Moreover, elders who were illiterate ($M=15.64, SD=4.719$) had significant difference from the elderly who were at primary school ($M=24.20, SD=2.821$). Accordingly, the result indicated that, elderly who were at high school level education had higher cognitive functioning compared to the rest.

In relation to marital status, there was a significant difference in cognitive functioning among all marital statuses, $F(3(112)=4.567, P<0.05$.

In line with this, the descriptive statistics result revealed that, the highest mean score of cognitive functioning was accounted by elderly who were married ($M=20.79, SD=6.005$) followed by divorced ($M=18.23, SD=5.465$) and the least mean score was for elderly who were single ($M=15.89, SD=5.883$) followed by those who were widowed ($M=16.67, SD=4.771$). Accordingly, the post hoc test showed that, married elders ($M=20.79, SD=6.005$) were significantly different from widowed ($M=16.67, SD=4.771$). However, there was no significant difference among the rest.

Discussion

According to WHO, more than 300 million people throughout the world suffer from depression [12]. A study conducted in North West Ethiopia reported the prevalence of depression to be 17.5% among adults [23]. Similarly, a literature review indicated that the pooled prevalence of depression was 6.8% [24]. A national health survey showed that the prevalence of depression was 9.1% in Ethiopia [25]. Concerning geriatric depression, Girma et al. found that its prevalence was 28.5% [26]. In comparison to other studies, this study came up with the highest rate of prevalence of depression (68.1%) among elders in the study area, KAMSD and KICCE. This high prevalence may be attributed to the institutional setting. This result is relatively closer to a study result conducted in a hospital located in South India [27]. We suggest that other researchers should consider elders living outside institutionalized care centers.

Older individuals face many challenges associated with physical and mental deterioration. Evidence suggests that aging is associated with a decline in the ability to perform several cognitive tasks [28]. Hamilton stated that individuals with cognitive impairment were older and had more depressive symptoms compared to normal controls [29]. Cognitive functioning is highly related to an individual's perceptions, memory, thinking, reasoning and awareness that deteriorates as a person ages [30]. There are remarkable indications that depressed elderly people often experience low cognitive functioning status [31]. Cognitive decline in elderly is characterized by impairments in daily activities including memory, decision-making ability, planning, organization and

mental flexibility [32]. One out of four-elders suffers from serious cognitive decline, which in turn, may result in dementia [13,14]. However, results from this study indicated that most of the elders (87.1%) had declined cognitive functioning.

A study conducted in the US indicated that as geriatric depression increases, the language, memory and processing speed decreases [29]. Similarly, our study showed that was a significant inverse relationship between depression and cognitive functioning ($r=0.48$, $p<0.01$).

Studies showed that, depression in general and geriatric depression in particular, is more prevalent among elders [33-38]. Similarly, a study conducted in Ethiopia indicated that there was gender difference in depression among the elders [39]. In contrast to most studies, this study found that there was no significant relationship between depression and gender. In addition to gender, depression is associated to age. As people get older, their level of depression gets higher [27]. Similarly, this study found that people who were 84 and older had more depressive symptoms compared to elders of other age groups. However, some studies indicated that the prevalence of depression doesn't consistently change based on age and marital status [40].

Old age is not only associated to depressive symptoms but also associated with cognitive decline [41]. This study showed that about half (45.7%) of the elders had moderate cognitive decline and 8.6% of them had severe cognitive decline. Consistently, a study reported that the level of cognitive decline was 31% among elderly patients in India [27]. Moreover, this study tried to see if there were differences in cognitive functioning across selected socio-demographic variables. In terms of age, consistent with this study, different studies reported that cognitive decline increase as aging increases [27]. Besides, the study indicated that male elders had relatively higher cognitive function compared to their female counterparts. Other studies confirmed the same result [27]. Our study detected that illiterate elders had lower cognitive performance compared to others. In addition, other similar studies indicated that elders more educated elders had less cognitive impairment [29,42-44]. However, other studies suggested that the relationship between cognitive functioning educational attainment [45,46].

Likewise, cognitive performance is related to gender. Most studies reported that male elders had better cognitive functioning compared to females [43,47,48]. Consistently, the present study confirmed this difference. In addition, the present study found that there was a significant difference in cognitive functioning between married and widowed elders. Married elders scored higher in MMSE score compared to the widowed. Similarly, other studies confirmed that elders with partners had higher score in cognitive performance compared to those who had no partner [49-53].

Conclusion

The study found that depression and cognitive declining was higher among elders in two selected institutionalized care

centers in Addis Ababa, Ethiopia. In addition, females scored lower in cognitive functioning compared to males. The study also indicated that increased age and illiteracy were associated with lower cognitive functioning and higher level of depression. Besides, elders without partners manifested higher depressive symptoms and lower cognitive functioning. This implies that elderly programs should consider social support system.

Conflicting Interest

The authors declare that there are no financial and non-financial competing interests.

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References

1. Santrock JW (2006) Life Span Development. 10th edn. New York, NY: McGraw-Hill Company.
2. MOLSA (Ministry of Labor and Social Affairs, Ethiopia) (2006) National Plan of Action for the Elderly. MoLSA, Addis Ababa, Ethiopia.
3. Riker AP, Brisbane HI (1997) Married and Single Life. 6th edn. New York, NY: McGraw-Hill Company.
4. <http://www.un.org/en/sections/issues-depth/ageing/>
5. CSA (Central Statistical Agency, Ethiopia) (2014) Statistical Report on the 2013 National Labour Force Survey. Addis Ababa, Ethiopia: CSA.
6. CSA (Central Statistical Agency, Ethiopia) (2007) National Population and Housing Census In Ethiopia. Addis Ababa, Ethiopia: CSA.
7. http://research.gsd.harvard.edu/hapi/files/2014/10/HAPI_ReserachBrief-Aging-PhyPsy-102814-FINAL.pdf
8. Beard JR, Officer AM, Cassels AK (2016) The world report on ageing and health. *Gerontologist* 56: S163-S166.
9. http://www.who.int/entity/ageing/publications/global_health.pdf?ua=1
10. Skoog I (2011) Psychiatric disorders in the elderly. *Canadian J Psychiatry* 56: 387-397.
11. WHO (2011) WORLD REPORT ON DISABILITY.
12. WHO (2017) Depression and other common mental disorders: Global health estimates. Geneva, Switzerland.
13. Unverzagt F, Gao S, Baiyewu O, Ogunniyi A, Gureje O, et al. (2001). Prevalence of cognitive impairment: Data from the indianapolis study of health and aging. *Neurology* 57: 1655-1662.
14. Park H, Connell J, Thomson R (2003) A systematic review of cognitive decline in the general elderly. *Int J Geriatr Psychiatry* 18: 1121-1134.

15. Medalia C (2012) Is aging depressing? The relationship between aging, gender and depression in older adults. pp: 1-45.
16. Bruce ML, McAvay GJ, Raue PJ, Brown EL, Meyers BS, et al. (2002). Major depression in elderly home health care patients. *Am J Psychiatry* 159: 1367-1395.
17. <http://www.apa.org/helpcenter/aging-depression.aspx>
18. <http://seleda.com/apr00/jebdu.shtml>
19. Albiński RE (2018) Geriatric Depression Scale (GDS). Validity and reliability of different versions of the scale-review. *Psychiatr Pol* 45: 555-562.
20. Malakouti SK, Fatollahi P, Mirabzadeh A, Salavati M, Zandi T (2006) Reliability, validity and factor structure of the GDS-15 in Iranian elderly. *Int J Geriatr Psychiatry* 21: 588-593.
21. Nyunt MSZ, Fones C, Niti C, Ng TP (2009) Criterion-based validity and reliability of the Geriatric Depression Screening Scale (GDS-15) in a large validation sample of community-living Asian older adults. *Aging Mental Health* 13: 376-382.
22. Folstein MF, Folstein SE, McHugh PR (1975) Mini-mental state: A practical method for grading the cognitive state of patients for the clinician. *J Psychiatric Res* 12: 189-198.
23. Molla G, Sebhat H, Hussen Z, Mekonen A, Mersha W, et al. (2016). Depression among Ethiopian adults: Cross-sectional study. *Psychiatry J* 2016: 1-5.
24. Bitew T (2014) Prevalence and risk factors of depression in Ethiopia: A review. *Ethiop J Health Sci* 24: 161-169.
25. Hailemariam S, Tessema F, Asefa M, Tadesse H, Tenkolu G (2012) The prevalence of depression and associated factors in Ethiopia: Findings from the National Health Survey. *Int J Mental Health Systems* 6: 23.
26. Girma M, Hailu M, Wakwoya A, Yohannis Z, Ebrahim J (2016) Geriatric depression in Ethiopia: Prevalence and associated factors. *J Psychiatry* 20: 400.
27. Naveen KD, Sudhakar TP (2013) Prevalence of cognitive impairment and depression among elderly patients attending the medicine outpatient of a tertiary care hospital in South India. *Int J Res Medical Sci* 1: 359-364.
28. Dixon RA, Backman B, Nelsson L (2004) *New Frontiers in cognitive aging*. Oxford, UK: Oxford University Press.
29. Hamilton JL, Brickman AM, Lang R, Byrd GS, Haines JL, et al. (2014). Relationship between depressive symptoms and cognition in older, non-demented African Americans. *J Int Neuropsychological Soc* 20: 1-8.
30. Harada C, Natelson LM, Triebel K (2013) Normal cognitive aging. *Clinics Geriatr Med* 29: 737-752.
31. Dewey M, Saz P (2001) Dementia, cognitive impairment and mortality in persons aged 65 and over living in the community: A systematic review of the literature. *Int J Geriatr Psychiatry* 16: 751-761.
32. Bhalla RK, Butters MA (2018) Cognitive functioning in late-life depression. *BC Med J* 53: 357-360.
33. Morimoto SS, Kanellopoulos D, Manning KJ, Alexopoulos GS (2015) Diagnosis and treatment of depression and cognitive impairment in late-life. *Annals of the New York Academy of Sci* 1345: 36-46.
34. Albert PR (2015) Why is depression more prevalent in women? *J Psychiatry Neurosci* 40: 219-221.
35. Kessler R (2003) Epidemiology of women and depression. *J Affective Disorders* 74: 5-13.
36. Abate KH (2013) Gender disparity in prevalence of depression among patient population: A systematic review. *Ethiopian J Health Sci* 23: 283.
37. Cole MG, Dendukuri N (2003) Risk factors for depression among elderly community subjects: a systematic review and meta-analysis. *Am J Psychiatry* 160: 1147-1156.
38. Zunzunegui M, Beland F, Llacer A, Leon V (1998) Gender differences in depressive symptoms among Spanish elderly. *Social Psychiatry Psychiatric Epidemiol* 33: 195-205.
39. Goodwin RG, Gotlib IH (2004) Gender differences in depression: The role of personality factors. *Psychiatry Res* 126: 135-142.
40. Maru Z (2009) Self-esteem, depression, loneliness and coping mechanism among retirees: The case in Arada sub city in Addis Ababa (MA Thesis, Unpublished) Addis Ababa, Ethiopia: Addis Ababa University.
41. Jerom AF (2000) Does old age reduce the risk of anxiety and depression? A review of epidemiological studies across the adult life span. *Psychol Med*: 11-22.
42. Adam S, Bonsang E, Germain S, Perelman S (2007) Retirement and cognitive reserve: A stochastic frontier approach applied to survey data.
43. Alley D, Suthers K, Crimmins K (2007) Education and cognitive decline in older Americans. *Res Aging* 29: 73-94.
44. de AzeredoPassos V, Giatti L, Bensenor I, Tiemeier H, Ikram M, et al. (2015) Education plays a greater role than age in cognitive test performance among participants of the Brazilian Longitudinal Study of Adult Health (ELSA-Brasil). *BMC Neurol* 15: 191.
45. Lenehan ME, Summers MJ, Saunders NL, Summers JJ, Vickers JC (2014) Relationship between education and age-related cognitive decline: A review of recent research. *Psychogeriatrics* 15: 154-162.
46. Wilson RS, Hebert LE, Scherr PA, Barnes LL, Mendes de Leon CF, et al. (2009) Educational attainment and cognitive decline in old age. *Neurol* 72: 460-465.
47. Leibovici D, Ritchie K, Ledesert B, Touchon J (1992) Does education level determine the course of cognitive decline? *Age Ageing* 25: 392-397.
48. Zhang Z (2006) Gender differentials in cognitive impairment and decline of the oldest old in China. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 61: S107-S115.
49. Rotar O, Moguchaya E, Alieva A, Orlov A, Boyarinova M, et al. (2015) Gender differences of the cognitive function in the elderly. *J Hypertens* 33: e440.
50. Feng L, Ng XT, Ya P, Li J, Lee TS, et al. (2014) Marital status and cognitive impairment among community-dwelling Chinese older adults: the role of gender and social engagement. *Dementia Geriatric Cognitive Disorders Extra* 4: 375-384.
51. Yeh SJ, Liu Y (2003) Influence of social support on cognitive function in the elderly. *BMC Health Services Res* 3: 9.
52. Zhu S, Hu J, Efrid JT (2012) Role of social support in cognitive function among elders in central China. *J Clinical Nursing* 21: 2118-2125.

53. Ren L, Zheng Y, Wu L, Gu Y, He Y, et al. (2018) Investigation of the prevalence of Cognitive Impairment and its risk factors within the elderly population in Shanghai, China. *Scientific Reports* 8: 3575.