

RETIREMENT: PREJUDICE AGAINST FUTURE COGNITIVE DECLINEPranathi R¹, Suguna S²**HOW TO CITE THIS ARTICLE:**

Pranathi R, Suguna S. "Retirement: Prejudice against Future Cognitive Decline". Journal of Evolution of Medical and Dental Sciences 2015; Vol. 4, Issue 15, February 19; Page: 2459-2465, DOI: 10.14260/jemds/2015/355

ABSTRACT: BACKGROUND: Age related cognitive decline is well documented, but less is known about changes in the cognitive functioning after retirement. **AIM:** To evaluate whether retirement affects cognitive performance. **OBJECTIVES:** 1. To compare cognitive performance in working and non-working retired individuals. 2. To assess the influence of active lifestyle, financial security and literacy on cognition of retiree. **METHODS:** The study included 50 retired non-workers as cases and 50 retired workers as controls in the age group of 60-65 yrs. Brief Test of Adult Cognition by Telephone (BTACT) was conducted on all subjects. Results were statistically analyzed using ANOVA. **RESULTS:** In the retired population, working group performed better than the non-working group ($p < 0.05$). However, highly educated non-workers had better scores than workers ($p < 0.05$). Also, the non-workers who had better financial security and active participation in leisure activities had better or equal scores ($p > 0.05$). **CONCLUSION:** Retirement has a negative impact on cognitive function which could be alleviated by factors like literacy, financial security and active life style. Increasing incidence of depression and dementia among the elderly highlights the importance of maintaining active mental health. Hence, this study emphasizes the factors preventing cognitive decline. **KEYWORDS:** retirement, cognitive decline, life style, financial security, literacy, BTACT.

INTRODUCTION: In India, 100 million people are above the age of 60 yrs, of which only 40% are working according to NSSO Survey on Employment- Unemployment (2007-2008) as stated [1]. Increased life expectancy combined with reduced average retirement age has increased the proportion of an individual's life spent in retirement. This demographic shift has increased the focus on physical and mental health in aging.

Bonsang E, Adam S and Perelman S (2010) state that decline in cognition with age has been well documented, but not homogenous. This suggests that some individuals use their cognitive resources more efficiently. Cognitive performance is important for work productivity and well-being.[2]

Retirement can be a stressful event implying major changes in individual's lifestyle leading to break with support groups and friends which are likely to affect cognition.

Unengaged lifestyle hypothesis supports Rohwedder and Willis study (2010) states that, retirees are engaged in less mental exercise than workers. The latter are exposed to cognitively more challenging and stimulating work environment compared to the non-working environment. Contradictory to the above, some authors suggest that retirement could be beneficial as it eliminates work related stress and preserves the health of retiree. Drentea (2002) supports the hypothesis that work is alienating and retirement liberating as retirees experience less anxiety and distress.[3]

Cognitive reserve has been found to depend on several factors. Education undoubtedly plays an important role. Other factors are occupation, engaging in mentally stimulating activities and active life style as stated by Bonsang E et. al. With incorporation of these factors in life, retirement might not affect cognition.[2]

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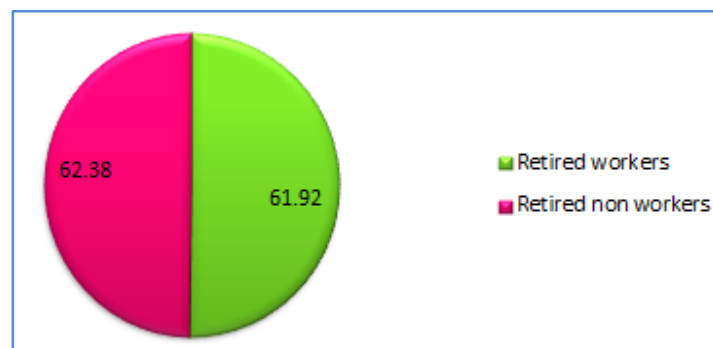
AIM OF THE STUDY: To compare cognitive stimuli at work and after retirement; considering factors like education, financial security and active life style which might mitigate negative relation between retirement and cognitive capacity.

MATERIALS AND METHODS: A Comparative study was done in retired population. 50 retired non workers as cases and 50 retired workers as controls in age group of 60- 65 yrs, BMI< 24 were considered. Retired workers are working in departments of accounts or as attendees in medical college. Study was approved by ethical committee. Written informed consent was taken and general physical examination done. Questionnaire was administered to rule out exclusion criteria like acute or chronic systemic illness, endocrine disorders such as diabetes, taking any medications, smoking, alcohol, substance abuse, head injury as listed by Sabia S et.al in 2012. Information about their education, pension eligibility and other sources of income was also taken into account [4]. Brief Test of Adult Cognition by Telephone (BTACT) was administered verbally to all subjects evaluating their working memory span, verbal memory, attention, reasoning, verbal fluency and speed of processing. BTACT comprises of immediate recall (IR), delayed recall (DR), backward digit span (BDS), category fluency (CF), number series (NS), backward counting(BC) and attention switching- normal, reverse and mixed (AS-n, AS-r, AS-m) tests [5]. Cognitive function test was first explained to the subject, two trials were executed by the subject and then the test was administered.

Retired non workers were divided into 3 groups with education < 9 yrs, 10-13 yrs and > 13 yrs and their performance was compared with that of the retired workers. Retired non-workers were divided into lower, middle and higher socioeconomic status based on Kuppuswamy's classification and was compared with retired workers [6]. Retired non-workers were divided into two groups i.e. those receiving pension and those not receiving pension and compared with retired workers. Retired non-workers were divided into two groups i.e. those participating in leisure activities like walking, jogging, etc. and those not participating. Cognitive function test scores of retired non-workers participating in leisure activities, retired non-workers not participating in leisure activities and retired workers was compared.

STATISTICAL ANALYSIS: Mean, Standard deviation, percentages and ANOVA were used to analyse the data. P value <0.05 is considered significant.

RESULTS: Graph 1: Retired workers and retired non-workers are age matched (p=0.092).



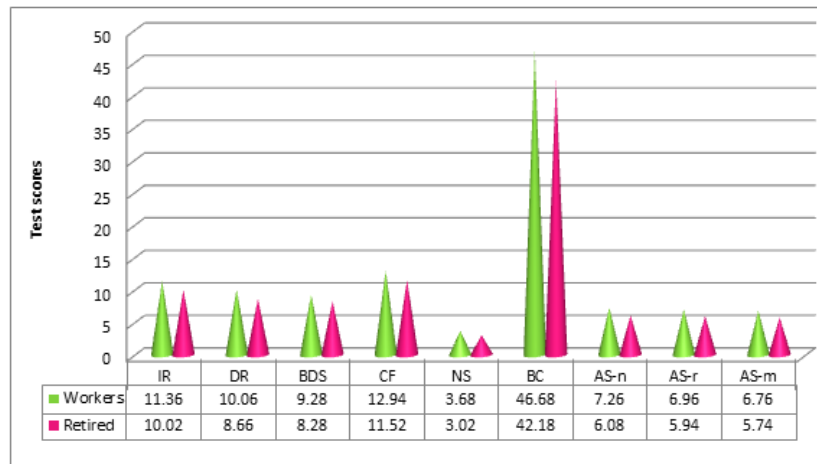
GRAPH 1

ORIGINAL ARTICLE

GENDER	Retired non-workers	Retired Workers	p value
MALES	28	29	0.4217
FEMALES	22	21	

Table 1: Retired workers and retired non workers are gender matched (p=0.4217)

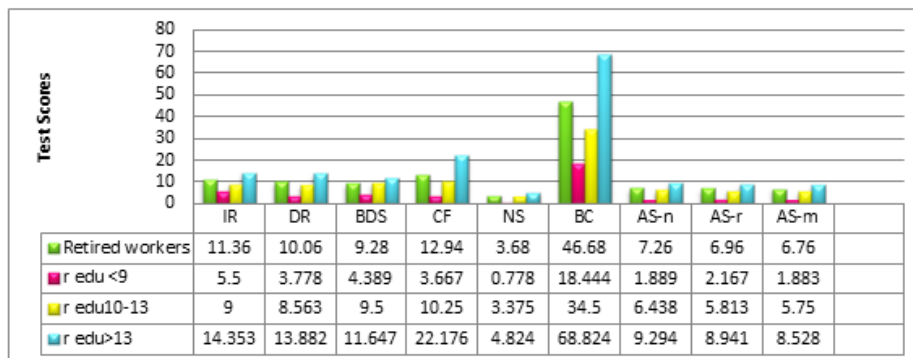
Graph 2: Cognitive Function Test scores among retired workers and retired non-workers.



GRAPH 2

Graph 2 shows that retired workers performed better than retired non-workers in all the cognitive function tests with $p < 0.05$ except for category fluency and backward counting tests where $p > 0.05$.

Graph 3: Cognitive function test scores among retired workers and retired non-workers considering their education status.

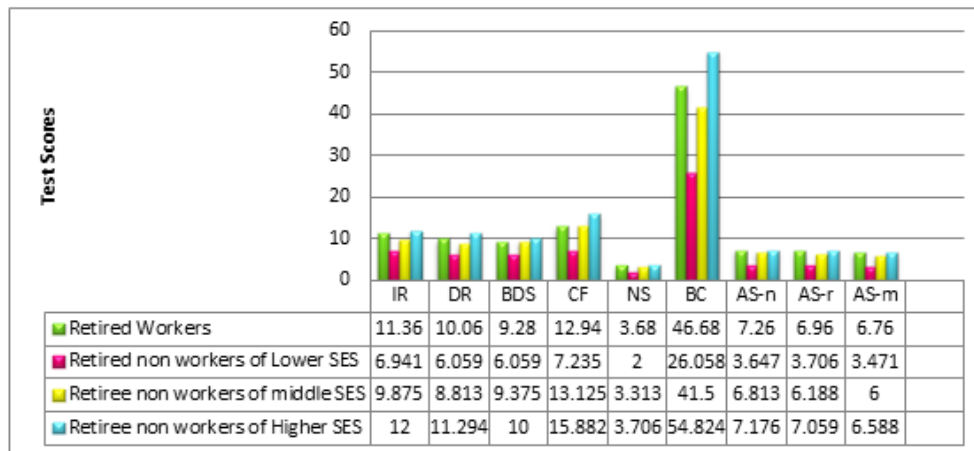


GRAPH 3

Graph 3 shows retired non-workers with education > 13 yrs performed better than retired workers ($p < 0.001$).

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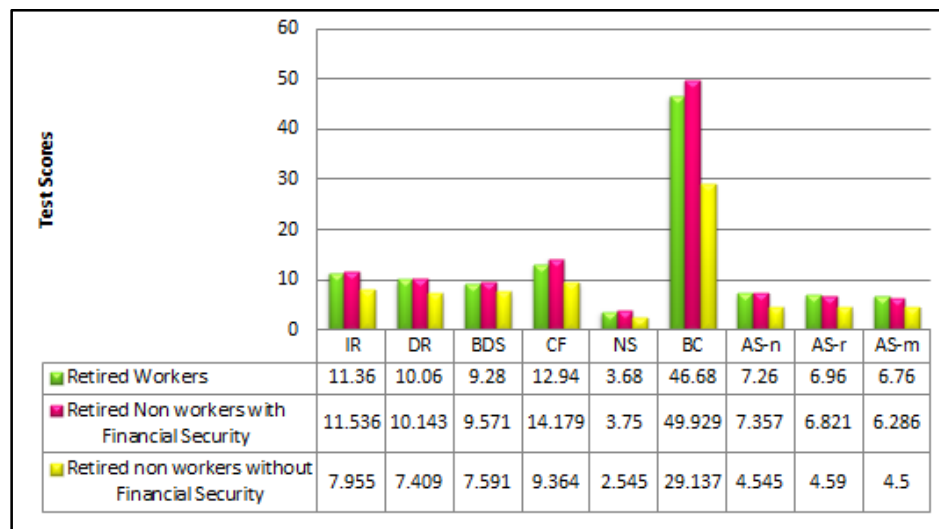
Graph 4: Cognitive function test scores among retired workers and retired non-workers considering their socioeconomic status.



GRAPH 4

Graph 4 shows higher socioeconomic status retired non-workers performed better than the retired workers ($p < 0.05$ except for category fluency test where $p > 0.05$).

Graph 5: Cognitive function test scores among retired workers and retired non-workers considering their financial security.



GRAPH 5

Graph 5 shows retired workers with financial security performed better than the other two groups i.e. retired workers and retired non-workers not receiving pension ($p < 0.05$ for immediate recall, backward counting and attention switching tests).

ORIGINAL ARTICLE

Graph 6: Cognitive function test scores among retired workers and retired non-workers considering participation in leisure activities.



GRAPH 6

Graph 6 shows retired non-workers participating in leisure activities performed better than the other two groups but p value not significant ($p > 0.05$).

DISCUSSION: Retired workers performed better in the cognitive tests compared to retired non-workers. Why does retirement cause cognitive decline? 'Unengaged lifestyle' hypothesis states that workers engage in more mental exercise than retirees because work environments provide more cognitively challenging and stimulating environments, than does the non-work environment. When factors affecting cognitive reserve are considered, then there is no negative effect of retirement on cognitive functions as stated by Rohwedder, Susann and Willis RJ (2010).^[7]

Educations can affect cognition through several pathways, including lifestyle choices, health behaviours, social interactions, labour-force participation, types of occupation and brain development. Studies have shown that the improvements in mental performance following education are related to changes in brain structures, affecting synaptic density, hippocampal volumes and cortical thickness. Some studies showed that the effect of one additional lower secondary school year leads to rise in IQ for young men by 3.7 points. Survey of Health, Aging and Retirement in Europe (SHARE) assessed causal effect of education on old-age memory, fluency, numeracy, orientation and dementia. Positive impact of schooling on memory was noted. One year of education increases the delayed memory score by about 0.3, which amounts to 16% of the standard deviation as shown by Schneeweis N, Skirbekk V and Rudolf in their study in 2012.^[8]

Retired non-workers with higher socioeconomic status and good financial security performed similarly like retired workers. 'Human capital theory' suggests another mechanism that might produce a mental retirement effect. Early retirement may bring about a decreased level of mental exercise. Human capital production function requires a person to combine cognitive ability, knowledge and effort to produce additional human capital. Thus, we hypothesize that differences in retirement incentives across countries create a reduction in mental exercise at work that may begin

ORIGINAL ARTICLE

well before actual retirement. This is called “on-the-job” retirement effect. In 2010, Rohwedder, Susann and Willis RJ have shown that intellectually demanding jobs during adulthood are associated with better cognitive functioning in later life, whereas manual labour are associated with worse cognitive functioning.^[7]

Participating in leisure activities help the elders to socially interact and exchange new information enabling them to learn new things. Studies have shown that scaffolding i.e. new circuits in the brain are formed and hence help them maintain or even improve the cognitive functions.

Well educated, financial secure and having a mentally and physically active life style helped non-workers perform better than the retired workers. Retired workers are under constant work pressure which is a type of stressor. Lopez JF, Akil H and Watson H (1999) in their study, show that stress induces structural remodelling of limbic system and prefrontal cortex like dendritic shrinkage, lesser arborisation, atrophy and decreased neurogenesis. Stress has also known to alter the neurotransmitter levels. Increase in noradrenaline in amygdala and prefrontal cortex, increased dopamine levels in medial frontal cortex suppresses limbic and dorsolateral prefrontal cortex. Glucocorticoids are increased in hippocampus. Decrease in serotonin in prefrontal cortex and dentate gyrus was noted. Cortical areas mentioned are centres of cognitive functions.^[9]

Cognitive impairment is a major cause of disability and care dependence. All people fear loss of cognition and the ability for self-care nearly as much as death itself. The most promising result of this study was that high levels of education not only extend life and extend life in good health, but truly compress cognitive impairment by postponing incidence of dementia more than death. Raising education to the highest level attainable in a society is therefore not only a millennium goal for developing countries. The best investments in future health remain investments in the best education today.

CONCLUSION: Results of this study highlight the negative impact of retirement on cognitive function which disappears or becomes positive when individual heterogeneity of literacy, financial security and engaged lifestyle are considered. The ‘use it or lose it’ hypothesis is still consistent with our findings that if mentally stimulating activity is pursued into retirement, individual cognitive abilities are either maintained or do improve also.^[7]

LIMITATIONS:

1. Small sample size.
2. Use of better standardized battery of cognitive function tests suitable for the South Indian population.

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ORIGINAL ARTICLE

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AUTHORS:

1. Pranathi R.
2. Suguna S.

PARTICULARS OF CONTRIBUTORS:

1. Post Graduate Student, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore.
2. Assistant Professor, Department of Physiology, Bangalore Medical College and Research Institute, Bangalore.

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NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Suguna S,
Bangalore Medical College and
Research Institute,
Fort, K. R. Road,
Bangalore-560002.
E-mail: drsugunas@gmail.com

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