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A-CROSS SECTIONAL CLINICAL ASSESSMENT ON MENTAL HEALTH AND NEURODEGENERATIVE SYMPTOMS IN RETIRED INDIVIDUALS.

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ABSTRACT

BACKGROUND: Retirement is a critical life transition that can impact cognitive health, potentially contributing to neurodegenerative symptoms. Early detection of cognitive decline in retired individuals is essential for timely intervention. This study assesses cognitive function and neurodegenerative symptoms using the Mini-Mental State Examination (MMSE) and Dementia Rating Scale-2 (DRS-2) in retired individuals. **METHODS:** After study approval (24/IMCH/034), this cross-sectional study was conducted between January 2024 to July 2024 on 90 retired individuals (mean age: 68.5 ± 5.4 years) using questionnaire based consecutive data collection technique following an informed consent. Cognitive function was evaluated using MMSE and DRS-2. The association between cognitive scores and socio-demographic variables was analyzed using chi-square tests, Pearson correlation, and multivariate regression. A p-value of <0.05 was considered statistically significant. **RESULTS:** The mean MMSE score was 24.1 ± 3.7, with 31.1% of participants showing cognitive impairment (MMSE <24). Cognitive decline was significantly associated with age (r = -0.42, p = 0.003) and years since retirement (r = -0.37, p = 0.008). The mean DRS-2 score was 121.3 ± 9.2, with impaired individuals showing lower scores in memory (p = 0.002), attention (p = 0.004), and conceptualization (p < 0.001). Hypertension (OR = 2.6, p = 0.009) and social isolation (OR = 3.1, p = 0.004) were independent predictors of cognitive impairment. **CONCLUSION:** Cognitive impairment and neurodegenerative symptoms are prevalent in retired individuals, with chronic illnesses and social isolation being key risk factors. MMSE and DRS-2 assessments provide valuable insights into early cognitive decline, highlighting the need for targeted mental health strategies post-retirement.

KEYWORDS: Cognitive decline, MMSE, DRS-2, neurodegeneration, retired individuals, dementia risk factors

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INTRODUCTION

The process of retirement leads people through major life changes which bring both psychological and physical modifications to their bodies[1]. The relief from occupational stress through retirement comes at the cost of increased cognitive decline because mental engagement decreases and social isolation intensifies together with age-related changes in the brain[2]. MCI together with neurodegenerative disorders grow more common as people age so healthcare professionals must detect problems early to initiate treatment properly [3].

The extent of cognitive decline that retired persons' experience depends on their age combined with their educational attainment as well as their life habits accompanied by existing chronic diseases like hypertension and diabetes and their relationship with others. [4] Prolonged mental inactivity seems to promote faster deterioration of brain tissue according to scientific research [5]. Accurate detection of early cognitive deficits among retired people must be a priority because these signs often signal Alzheimer's disease or vascular dementia or any other neurodegenerative disease [6].

The diagnostic value of evaluating cognitive impairment depends on both the Mini-Mental State Examination (MMSE) and the Dementia Rating Scale-2 (DRS-2) neurocognitive evaluation tools[7]. Healthcare professionals regularly use the MMSE to examine orientation along with memory and attention but the DRS-2 offers greater detailed analysis of conceptualization and information recall and initiation/perseveration behaviors [8]. The assessment tools assist health professionals in differentiating normal cognitive aging from signs of brain disease [9,10]. The researchers use MMSE and DRS-2 as instruments to evaluate cognitive abilities in retired individuals while studying their relationship to demographics and health conditions. The research will examine vital factors causing cognitive regression to generate strategies that enhance cognitive health in older adult populations.

METHODOLOGY

After study approval (24/IMCH/034), this cross-sectional study was conducted between January 2024 to July 2024 on 90 retired individuals (mean age: 68.5 ± 5.4 years) using questionnaire based consecutive data collection technique following an informed consent. Cognitive function was evaluated using MMSE and DRS-2. The study recruited 90 retired participants whose average age was 68.5 years (± 5.4 years' standard deviation). People received entry into the study if they had spent at least half a year retired along with no neurological disease background and full ability to give consent. This study excluded participants who suffered from severe psychiatric conditions together with pre-retirement cognitive impairment. Two standardized neurocognitive evaluations consisting of the MMSE and DRS-2 measured cognitive dysfunction during data collection processes. The MMSE functions as a brief assessment instrument to measure memory together with attention and language skill and orientation abilities. The results below 24 points identify cognitive impairment. Thorough cognitive screening through the DRS-2 measures all major aspects of memory in addition to attention and executive functions and initiation abilities and conceptualization along with providing differentiated levels of cognitive dysfunction assessment. The testing was conducted by psychologists who received specific training in the matter. This research collected socio-demographic and health data through structured questionnaires by documenting participant demographics together

with education level and retirement duration and age and gender information. Patients reported their health condition along with medical record reports of hypertension diabetes and cardiovascular diseases. The research team evaluated the connection between cognitive test results (MMSE and DRS-2) and demographic attributes using chi-square statistics on classification variables in addition to continuous variable correlations through Pearson method testing. The research utilized multivariate regression analysis to detect major indicators of cognitive decline at $p < 0.05$ significance point. All procedures gained authorization from an institutional review board through ethical approval process alongside consent from every research participant.

RESULTS

The study included analysis of 90 aging subjects who retired on average at 68.5 ± 5.4 years. The research examined cognitive abilities of participants through Mini-Mental State Examination (MMSE) and Dementia Rating Scale-2 (DRS-2) as shown in table 1.

Table 1: Descriptive Statistics of the Study Participants

Variable	Mean ± SD	Range
Age (years)	68.5 ± 5.4	60 – 81
Years since retirement	6.5 ± 3.1	1 – 15
MMSE Score	24.1 ± 3.7	12 – 30
DRS-2 Score	121.3 ± 9.2	100 – 145

A majority of participants demonstrated excellent cognitive ability according to MMSE scores yet DRS-2 assessments within the cohort demonstrated different levels of cognitive performance. The DRS-2 domains showed significant impairments in memory, attention, and conceptualization ($p < 0.05$). These results indicate that the cognitive decline in retired individuals is predominantly in the areas of memory and executive functions, which are often affected early in neurodegenerative diseases like Alzheimer's. Age and years since retirement had a moderate negative correlation with cognitive scores, suggesting that older age and prolonged retirement are associated with worse cognitive function. Education level had a positive correlation, indicating that higher education may protect against cognitive decline in this cohort. Table 2 provides comprehensive study insights.

Table 2: Study Characteristics for MMSE and DRS-2 Evaluation

Cognitive Impairment Classification by MMSE			
MMSE Score Range	**Number of Participants (%)**	**Cognitive Impairment (%)**	
24-30	62 (68.9%)	0%	
<24	28 (31.1%)	100%	
Cognitive Performance on DRS-2 by Domain			
Cognitive Domain	Mean Score ± SD	p-value	
Memory	32.4 ± 4.1	0.002	
Attention	19.7 ± 3.2	0.004	
Conceptualization	30.5 ± 2.9	<0.001	
Initiation/Preservation	38.7 ± 3.6	0.03	
Correlation Between Cognitive Scores and Socio-Demographic Factors			
Factor	MMSE Score (r)	DRS-2 Score (r)	p-value
Age	-0.42	-0.37	0.003
Years since retirement	-0.37	-0.32	0.008
Education level	0.25	0.27	0.04
Gender (Male)	0.12	0.18	0.25
Risk Factors Associated with Cognitive Decline			
Risk Factor	Cognitive Impairment (%)	OR (95% CI)	p-value
Hypertension	41.7%	2.6 (1.3-5.2)	0.009
Diabetes	34.5%	1.8 (0.9-3.7)	0.07

Social Isolation	48.5%	3.1 (1.5-6.5)	0.004
Impact of Years Since Retirement on Cognitive Function			
Years Since Retirement	MMSE Score <24 (%)	DRS-2 Impaired (%)	p-value
1-5	23.0%	28.0%	0.02
6-10	32.1%	38.0%	0.04
11-15	50.0%	54.0%	0.01

Research showed that 31.1% of participants suffered cognitive impairment where MMSE scores demonstrated inverse correlations to both participant age ($r = -0.42$, $p = 0.003$) and retirement duration ($r = -0.37$, $p = 0.008$). Participants displaying cognitive impairment achieved significantly worse results in memory, attention and conceptualization tests from DRS-2 assessment ($p < 0.05$). Results showed hypertension together with social isolation proved statistically significant as independent factors which increased the risk for cognitive impairment (OR = 2.6, $p = 0.009$, OR = 3.1, $p = 0.004$ respectively). The duration of retirement beyond 10 years proved to be a significant risk factor for cognitive impairment since half of surveyed individuals revealed impaired cognitive capabilities. The research demonstrates that age combined with years in retirement and chronic disease patterns severely affect cognitive ability.

DISCUSSION

The research study demonstrates that retired individuals experience wide-spread cognitive decline because of their age and retirement length alongside hypertension status and social isolation. The research observes that retirement has substantial effects on cognitive health and neurodegenerative symptoms in accordance with recent scholarly works. The research data showed that cognitive impairment affected 31.1% of participants whose MMSE results were less than 24. Multiple studies demonstrate that elderly adults who have retired frequently develop mild cognitive impairments (MCI) and related cognitive decline. Experts have proven that retirement decreases both mental stimulation and social contact which produce cognitive decline based research [11].

Brain degeneration occurs faster because work-related mental challenges and social networks fail to activate or stimulate the brain [12]. Future research needs to focus on this matter because neurodegenerative disease indicators including AD and vascular dementia often begin with cognitive deterioration [13]. Researchers have long confirmed that cognitive abilities decrease as people grow older based on the results showing the negative link between age and cognitive scores ($r = -0.42$, $p = 0.003$). The normal aging process results in brain tissue alterations together with hippocampus atrophy in memory processing areas as people advance in years [14]. Research findings demonstrate that the duration since retirement ($r = -0.37$, $p = 0.008$) in addition to age ($r = -0.42$, $p = 0.003$) both negatively affected cognitive function. Such brain changes appear to worsen because of two Senior life events: reduced cognitive activities combined with diminished social connections in retirement environments [15,16].

Research indicates that continued mental activity from age to age can help shield people from cognitive deterioration is according to previous research [17]. The time period since retirement directly influences the probability of cognitive impairment developing in individuals [18]. Reviews show that cognitive impairment levels rise when people retire for 11-15 years then cognition starts to decrease in half of those affected. Research demonstrates why ongoing mental challenges coupled with social connections should be maintained throughout retirement since some persons might lack suitable cognitive-enriching tasks after leaving work. The study showed hypertension as an important risk factor for cognitive decline through an odds ratio value of 2.6 ($p = 0.009$). Extensive research supports that hypertension during middle age functions as a significant risk element which leads to cognitive deterioration as well as dementia progression in later years [19]. High blood pressure initiates multiple vascular

brain modifications such as small vessel disease and ischemia that harm mental operations [20,21]. The research results demonstrate how retired persons with social isolation or hypertension need specific interventions to support their cognitive health. The delay or reduction of cognitive deterioration can be achieved through mental engagement methods such as cognitive training and social programs as well as routine physical activities. Medical institutions should actively monitor Cognitive Impairment conditions during retirement screenings particularly when patients possess many known risk factors.

CONCLUSION:

Cognitive impairment together with neurodegenerative symptoms commonly affect retired people because of their advancing age and time spent retired as well as hypertension and social isolation status. The research indicates that detecting cognitive decline and establishing proactive approaches must be prioritized to protect retired individuals from mental decline. A combined approach of mental health and physical health care represents a vital solution to improve cognitive health after retirement.

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