Relation Between Cognitive Function and Abuse among Rural Elderly People

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ABSTRACT

Background: Cognitive function and elder abuse are increasingly recognized as critical public health concerns, particularly among older adults in rural settings, where healthcare access and social support are often limited. Age-related cognitive decline may increase vulnerability to abuse in many forms, such as neglect, financial, psychological, and physical. **Aim of the study**: This study aimed to investigate the relation between cognitive function and abuse among rural elderly people. **Subjects and methods: Design**: The study adopted A descriptive cross-sectional design. **setting**: the study was conducted in El Ghar village. **Subjects** : a purposive sample of 230 older adults .**Tools of data collection**: Data collection was conducted using three primary tools: tool 1 composed of 2 parts demographic characteristics and medical history, tool 2 : the Hwalek- Sengstock Elder Abuse Screening Test (HS-EAST) and tool 3: the Modified Mini-Mental State Examination (3MS). **Results**: Findings revealed that 51.7% of participants reported high levels of abuse exposure, while 43.9% exhibited moderate cognitive impairment and 30.3% showed severe impairment. A statistically significant positive correlation was identified between total abuse exposure and cognitive decline ($p = 0.000$). **Conclusion**: Cognitive deterioration appears to be effective factor of elder abuse risk. **Recommendations**: The elder abuse education and outreach program for elder people to identify and prevent elder abuse, nursing intervention program for elderly people to improve cognitive abilities.

Keywords: Abuse, Cognitive function, Rural elderly.

Introduction

Population aging represents a global demographic shift with profound public health implications. By 2050, it is projected that over 2.1 billion individuals worldwide will be aged 60 years or older, with the majority residing in developing nations **(Parker, et al., 2025).** The World Health Organization **(WHO, 2020)** defines elder abuse as "lack of appropriate action, occurring within any relation where there is an expectation of trust, which causes harm or distress to an older person." Elder abuse is associated with adverse outcomes including increased morbidity, psychological distress, reduced quality of life, and elevated mortality rates **(Atim et al., 2023).**

Cognitive impairment, characterized by deficits in attention, memory, executive function, and global

cognitive decline, is among the most salient risk factors for elder abuse. As cognitive deterioration progresses, older adults may become less capable of recognizing, resisting, or reporting abuse, thereby increasing their vulnerability **(Li and Dong, 2021).**

Empirical studies have established a statistically significant association between cognitive dysfunction and heightened exposure to abuse among the elderly **(Parker, et al., 2025).** Nurses play a vital role in supporting elderly individuals, addressing issues like abuse, cognitive decline. They perform thorough assessments to detect early signs and initiate timely interventions, educating caregivers on recognizing and managing these challenges. In promoting cognitive health, nurses encourage brain-stimulating activities, routine check-ups and chronic illness management **(Seddigh et al., 2020).**

Significance of the study

Elder abuse remains a pervasive and underreported issue in many parts of the world, including Egypt, where older adults frequently face different abuse types National and regional data suggest a high frequency of abuse against seniors, particularly in rural regions where socio-economic constraints, healthcare disparities, and social isolation exacerbate vulnerability. A recent study indicated that approximately 69.4% of the elderly population in Egypt experienced anyway one type of abuse within the preceding annual **(Abdo et al., 2024).**

One of the ultimate critical determinants contributing to elder abuse is cognitive impairment. As cognitive decline progresses, older adults may face diminished capacity to seek help, resist coercion, or comprehend abusive situations. Studies estimate that approximately 2.3% of older adults in rural communities exhibit clinically significant cognitive deficits. This cognitive vulnerability may be compounded by additional risk factors such as low educational attainment, poverty, solitary living, and chronic comorbidities **(Arora et al., 2023).**

Although this issue has significant consequences, there is a lack of research exploring the connection between cognitive function and elder abuse in rural areas of Egypt. This study aims to fill that gap by investigating the relation between cognitive function and abuse among rural elderly people.

Aim of the study

The primary aim of this study is to investigate the relation between cognitive function and abuse among rural elderly people.

Objectives

1.To detect the prevalence of elder abuse among rural elderly people.
2. To assess the level of cognitive function among rural elderly people.
3.To investigate the relation between cognitive function and abuse among rural elderly people.

Research questions

1. What is the prevalence of elder abuse among rural elderly people?
2. What is the level of cognitive function among rural elderly people?
3. Is there relation between cognitive function and abuse among rural elderly people?

Subjects and methods

Study design

A descriptive cross-sectional design was adopted to conduct this research.

Setting

This study was performed in El Ghar Village, positioned within the Zagazig District of Sharqia Governorate, Egypt. The village was selected through a multistage cluster sampling technique, which involved:

- **Stage 1: Selection of district**

- Random selection of one district (Zagazig) from 21 in the governorate.

- **Stage 2: Selection of village**

- Random selection of one village from 75 villages within the district.

- **Stage 3: Selection of streets**

- Division of the selected village into seven sectors, from which four were randomly chosen.
- From each selected sector, four streets were randomly selected.

- **Stage 4: Selection of participants**

- Eight houses were chosen at random from each street, and all eligible older adults within those households were approached for participation.

Sample and sampling technique:

A purposive sample of 230 elderly individuals was chosen according to the current standards:

- Both male and female participants.
- Ability to communicate effectively.
- Willingness to provide informed oral consent.

Tools for data collection:

Data were collected using a structured interview questionnaire composed of the following three tools:

Tool I: structured interview questionnaire was designed by the researcher and consisted of the following two parts:

Part 1:

Demographic characteristics of the studied elderly: entails data about demographic characteristics of the studied elderly which consisted of 8 questions to gather information about age, gender, marital status, educational level, job before retirement, current job, monthly income and living with.

Part 2:

Medical history: This part was developed by the researcher and consisted of two questions to collect data about having chronic illnesses, In case of yes, what are the chronic diseases, Suffering from physical disabilities , In case of yes, what is the disability.

Tool II: Hwalek-Sengstock Elder Abuse Screening Test (HS-EAST) developed by **Neale., et al (1991),** this 15-item validated scale assesses the risk of elder abuse across multiple dimensions. Responses were scored to identify those at high risk, with a threshold score indicating probable exposure to abuse. The scale consists of three domains; first domain overt violation of personal rights and direct abuse (consists of questions 4,9,10,11and 15), second domain: characteristics of elder that make him or her vulnerable to abuse (consists of 1, 3 and 6) and third domain: characteristics of potentially abusive situations (consists of 2,5,7,8,12,13 and 14)

Scoring system:

The grade is from 0 to 15, and if this grade is greater than 3 indicating older adult abuse. A higher grade shows a higher likelihood of abuse answer of "no" to points 1, 6, 12, and 14; Answer of "someone else" to point 4; and answer of "yes" to all others is scored in the "abused" direction **(Cohen, 2011).**

Tool III: Modified Mini-Mental State Examination (3MS)

Adapted from **Teng and Chui (1987)**, the Arabic-translated and validated version by **Ghonim et al. (2018)** was employed. It consists of 15 questions. It

is a global measure of cognitive abilities tapping domains such as long term memory (5 points), registration (3 points), attention (7 points), first recall (9 points) , temporal orientation (15 points), spatial orientation (5 points), naming (5 points), language ability (10 points) , similarities (6 points), repetition (5 points), read and obey (3 points), writing (5 points), coping 2 pentagons (10 points), three stage command (3 points), second recall (9 points) Instructions were given verbally; two of the items involve visual stimuli (questions 7&13).

Scoring system

The scores of 15 items(13items for illiterates) were summed up and the cognitive abilities were classified according to the total score gained by the elderly in the test as follows:
-cognitive impairment might be Mild: ≥78%
- cognitive impairment might be Moderate: 60–77%
- cognitive impairment might be Severe <60%

Content validity and reliability

Validity of tool was verified through a panel of three specialists include two professor of Community Health Nursing, Faculty of Nursing, Zagazig university and one professor of Community Medicine, faculty of medicine. Modifications were incorporated based on their recommendations. Reliability was assessed using Cronbach's alpha coefficient, which displayed strong internal consistency:
- Abuse & neglect presence: $\alpha = 0.82$
- Cognitive function domains: $\alpha = 0.87$

Field work

The researcher interviewed each elderly person separately, introducing herself, briefly outlining the goal of the study, the oral consent to gather the required data was then acquired. During the interview, each old person completed the study instruments in their living homes, and It took between twenty-five and thirty minutes. The fieldwork was conducted twice a week, on Saturdays and Fridays, from 12 to 6 p.m., for six months, from the start of October 2023 to the end of March 2024.

Pilot study

To assure the clarity and comprehensiveness of the tool, a pilot study was performed on a sample of 23 elderly people who were randomly selected from the chosen village; they were not included in the total number of subjects.

Administration and ethical considerations

Ethical approval was obtained from the Research Ethics Committee at the Faculty of Nursing, Zagazig University, Egypt **(Approval Code: M.D.ZU.NUR /158/13/6/2023).** All study subjects were told of the study's objectives, and gave oral informed consent prior to participation. Participants were told that they might depart from the study at any time while completing the questionnaire and were given the option to decline participation.

Statistical analysis

The data collected from the study sample were reviewed, coded, and entered using a personal computer. Data entry and statistical analysis were conducted using the Statistical Package for the Social Sciences (SPSS), descriptive statistics—such as frequencies, percentages, means, and standard deviations—were employed to summarize and present the data.

Pearson's correlation analysis was conducted to determine the strength and direction of the relationship between. statistical relationship between two continuous variables. The Chi-square (χ^2) test was used to examine associations between categorical variables. Additionally, multiple linear regression analysis was employed to predict the value of a single dependent variable based on two or more independent variables.

Results

Table 1: shows mean age of elderly was X±SD 68.75±4.28 and 52.6 of them had ages ranging between 60 to 65 years old. Moreover, 69.1 of them were males and 71.3 of them were married. As regards their educational level, 39.1 of them had bachelor's degree. Concerning their jobs, 59.6 of them worked at private sector before retirement and about the current job, 68.3 of them reported not working. As regards their monthly income, 75.2 of them reported that it was not enough. 69.1% of elderly reported that living with family.

Table 2: states that 87.8 of studied elderly suffered from chronic diseases and those stated suffered from chronic diseases mentioned diabetes (76.2) and hypertension (68.8). Moreover, only 1.3 of the them suffered from physical disabilities in extremities.

Figure 1 revealed that 51.7% of the elderly participants exhibited high level of abuse and neglect, 28.6 of them had moderate level while only 19.7 of them had low level of abuse and neglect.

Figure 2: reveals that 43.9% of the studied elderly had total moderate cognitive impairments, 30.3% of them had total high cognitive impairments and 25.8% of them had total low cognitive impairments.

Table 3 elicits that, there is a statistically significant positive correlation between the studied elderly' total presence of abuse and neglect and total cognitive domains at (p= 0.02).

In multivariate analysis, **table (4)** declares a statistically significant independent positive predictors of total abuse exposure screening were marital status and living with (alone). The module explains 28% of the variation.

In multivariate analysis, **table (5)** figures a statistically significant independent positive predictor of total cognitive domains were age, while education level was negative predictor. The module explains 22% of the variation.

Discussion

The present study examined the demographic characteristics of the elderly population, revealing a mean age of 68.75±4.28 years, with more than half falling within the 60 to 65-year age range. This could be attributed to the targeted nature of the study population. These findings align with research conducted in India by **Sathya and Premkumar (2020),** which reported that over 61.9% of the elderly were aged between 60 and 69 years. Conversely, a study in West Bengal by **Sembiah et al. (2020)** found a higher mean age of 71.82 years (SD=9.85). This discrepancy could be explained by demographic differences between regions and variations in population composition.

The current research also revealed that over two-thirds of the elderly had been male, and fewer than three-quarters were married .These results align with the findings of **Xue et al. (2022)** in China, which reported that slightly more than half (50.79%) of the studied participants were male, while the majority (82.54%) were married. However, a study by **Jing et al. (2020)**

in China presented contrasting results, indicating that over half (53.5%) of the elderly participants were female. This variation may be attributed to differences in demographic composition across regions and study populations. Also, this study found that nearly two-fifths of the participants held a bachelor's degree, highlighting the growing interest in education in rural areas. This trend may suggest an increasing emphasis on higher education accessibility and the value placed on academic achievement within these communities.

In contrast, a study implemented by **Gregory et al. (2024)** in Canada reveal that the majority of participants (79.38%) had obtained a post-secondary degree or diploma. This differs significantly from findings in West China, where **Ge et al. (2020)** reported that the highest percentage of participants (38.2%) had only completed primary school. These differences may stem from historical and socio-economic factors that shape educational access and attainment across different regions, particularly in rural communities.

As for jobs, the present study found that more than half of the elderly participants had worked in the private sector before retirement. However, when asked about their current employment status, more than two-thirds reported not working. This trend may be influenced by various factors, including retirement age, health conditions, or personal choice. These findings align with a study performed by **Aajami et al. (2020),** which revealed that 58.6% of the elderly participants had been employed in the private sector prior to retirement, while the majority (81.8%) were unemployed afterward. Such patterns reflect broader shifts in workforce participation among aging populations.

The current study indicated that most of the studied elderly who reported living with others stated living with relatives. In addition, about three quarters of them reported that their income was not enough. This finding might be due to rural economy often relies on agriculture or traditional industries, which may not offer stable or lucrative income streams, especially for older workers.

These findings were congruent with a study conducted by **El-Khawaga et al. (2021**) in Egypt, stated that the largest proportion of the studied elderly (82.5%) live with their relatives and about two thirds of them (66.5%) reported that their income was not enough. In the opposite line, a study in Egypt, performed by **Mousa et al. (2023)** and reported most of the studied elderly (71.8%) were satisfied with their income representing. This contradiction may be related to socio-economic differences between both study groups.

Regarding medical history, the current study found that the majority of elderly participants suffered from chronic diseases. This may be attributed to the natural aging process, which increases susceptibility to chronic conditions due to the gradual decline in physiological functions. These findings align with a study performed by **Tsoy et al. (2019)** in Kazakhstan, which reported that 87.7% of the studied elderly experienced chronic illnesses. Such results highlight the growing need for improved healthcare strategies to support aging populations.

The current investigation revealed that over three-quarters of the elderly participants suffered from diabetes, while more than two-thirds had hypertension. Additionally, a small

portion experienced physical disability in their extremities. These findings align with research conducted in China by **Jia et al. (2020),** which reported that 64% of elderly participants had diabetes and over half (58.3%) exhibited high blood pressure.

To address the initial research question regarding the prevalence of elder abuse among rural elderly individuals, the present study found that more than half of the participants experienced high levels of abuse and neglect. Additionally, over one-quarter reported moderate abuse and neglect, while nearly one-fifth experienced lower levels of maltreatment. These findings emphasize the significant impact of socioeconomic constraints and the lack of adequate support systems, which can increase the vulnerability of elderly individuals to abuse. This emphasizes the urgent need for improved protective measures, community awareness, and social interventions to address this pressing issue.

In the same way, a study in Iran guided by **Papi et al. (2022)** demonstrated that more than half (55.2%) of elderly participants reported experiencing a high level of abuse. However, these findings contrast with research by **Sembiah et al. (2020)** in India, which reported a lower prevalence, with only 25.6% of studied elders facing high levels of abuse. This variation may be attributed to differences in sample criteria, regional socio-economic conditions, and cultural factors influencing perceptions and reporting of elder abuse in rural communities.

Regarding the second research question on cognitive level among rural elderly individuals, the present study showed that more than two-fifths of participants exhibited moderate cognitive function, while less than one-third demonstrated high cognitive abilities, and approximately one-quarter showed lower cognitive domains. These variations may stem from differing levels of cognitive reserve, lifestyle influences, and access to mental stimulation within this population. Cognitive reserve, developed through educational experiences, occupational complexity, and engagement in intellectually enriching activities, plays an important role in mitigating cognitive decline and encouraging higher cognitive function **(Hussenoeder et al., 2020).**

In contrast, research conducted in the USA by **Yuan et al. (2021)** showed that the largest proportion of elderly participants (36.4%) had high cognitive impairment, while a smaller percentage (30.1%) exhibited moderate impairment. On the other hand, findings from **Hayajneh et al. (2020)** in Jordan differed from the current study, indicating that most older adults (87.4%) had low levels of cognitive impairment. These variations may be attributed to differences in study populations, healthcare availability, and environmental factors influencing cognitive function across different regions.

Regarding the third research question on the relation between elder abuse and cognitive function among rural elderly individuals, the present research identified statistically significant positive correlation between the total presence of abuse and neglect and overall cognitive function. This suggests that experiences of abuse and neglect can exert a significant influence on mental well-being and cognitive

abilities. Similarly, **Alexa et al. (2020)** conducted a study in eastern Romania, revealing that elderly individuals who experienced abuse had impaired cognitive function. Likewise, research by **Alon, (2021)** in Gaza found lower levels of cognitive functioning are related to high risk of abuse.

As regard multiple linear regression model for the studied elderly' total abuse exposure screening, the present study displayed that statistically significant independent positive predictors of total abuse exposure screening were marital status and living with whom (alone). From the research investigator point of view, this may be attributed to elderly individuals who are single, divorced, or widowed may lack the protective support of a spouse, making them more susceptible to abuse. Those living alone are often more isolated, which can increase their risk of abuse and decrease their likelihood of having abuse detected by others **(Yalçın et al., 2023).**

In the same line, **Hazrati et al., (2020)** in Shiraz whose study stated that elderly' marital status (widowed) and living alone were positive predictors of abuse. Consistently, a study conducted by **Sezer et al., (2021)** in Turkey reported that abuse risk was higher among older people who lived alone and who were widowed.

For cognitive function, age emerged as a significant positive predictor, whereas educational level emerged as a negative predictor. This suggests that elderly individuals with lower educational level are exposed to cognitive impairment, while older age groups show a higher likelihood of cognitive decline. These results align with findings from **Yuan et al. (2020)** in the USA, which identified age and education as key predictors of cognitive impairment. Similarly, **Wang et al. (2020)** found that age and education significantly influenced elderly cognitive function. These insights emphasize the crucial function of socio-demographic factors in shaping elder abuse risk and cognitive health.

Conclusion

It can be concluded that more than half of the studied elderly had high abuse and neglect while only less than one fifth of them had both low abuses. More than one third of elderly had both total moderate cognitive impairments. The study reveals a significant positive correlation between cognitive decline and elder abuse among older adults living in rural areas.

Recommendations

- Implement public health education campaigns addressing elder abuse.
- Establish cognitive training and support programs for the elderly.
- Incorporate abuse and cognitive screening tools into routine geriatric care.
- Advocate for policy changes to enhance legal protections for older adults.
- Conduct further longitudinal and interventional research.

Author's contributions

H.E.M.: Conceptualized the study and designed the research framework. E.S.A.: Led data collection and coordinated fieldwork activities. A.A.E.: Performed statistical analysis and interpretation of data. All authors participated, revised, and approved the final manuscript.

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Declaration of conflicting interests

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Table 1: The study's older participants' percentage distribution by demographic characteristics (n=230)

Profile of population	**N**	**%**
Age		
60-<65	121	52.6%
66-<70	94	40.9%
>70	15	6.5%
x ± SD 68.75±4.28		
Gender		
Male	159	69.1%
Female	71	30.9%
Marital status		
Married	164	71.3%
Divorced	13	5.7%
Widow	53	23.0%
Educational level		
Illiterate	13	5.7%
Read and write	43	18.7%
Primary education	84	36.5%
Bachelor education	90	39.1%
Job before retirement		
Governmental	93	40.4%
Private	137	59.6%
Current job		
Don`t work	157	68.3%
Non-craft worker	11	4.8%
Craft worker	19	8.3%
Professional work (doctor, teacher…….)	24	10.4%
Employer	13	5.7%
Businessman	6	2.6%
Monthly income		
Not enough	173	75.2%
Enough	41	17.8%
Enough and saving	16	7.0%
Living with		

Alone	52	22.6%
Family	159	69.1%
Others	19	8.3%

Table 2: Distribution of the elderly by medical history as a percentage (n=230)

Items	**N**	**%**
Having long-term illnesses		
Yes	202	87.8%
No	28	12.2%
***In case of yes, the diseases are (no= 202)**		
Diabetes	154	76.2%
Hypertension	139	68.8%
Kidney diseases	32	15.8%
Liver diseases	11	5.4%
Suffering from physical disabilities		
Yes	3	1.3%
No	227	98.7%
In case of yes, the disability is (no. 3)		
Extremities of upper or lower limbs	3	100

Not mutually exclusive

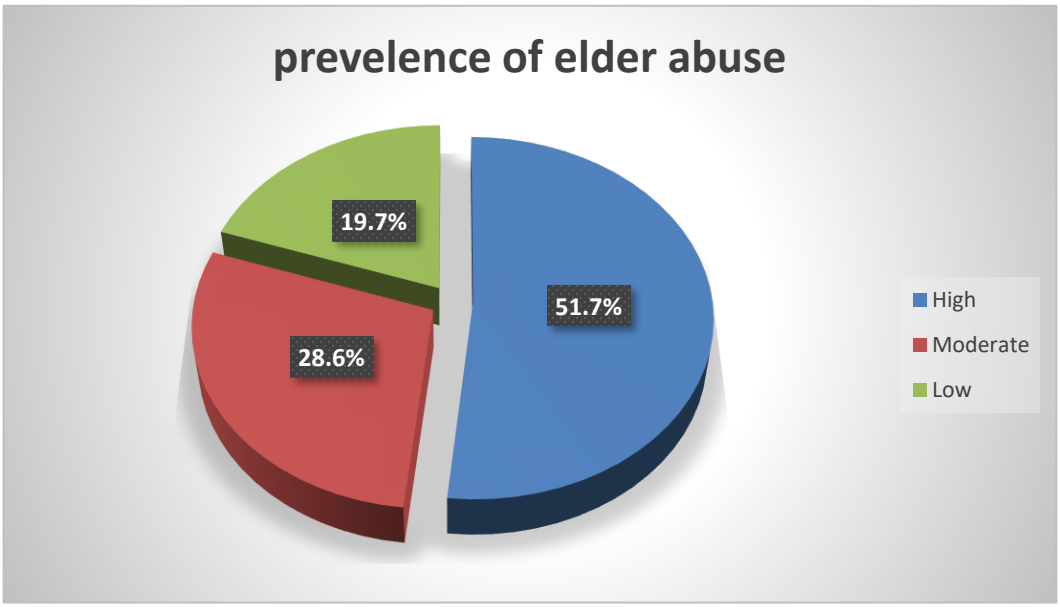

Figure (1): Prevalence of elder abuse among studied elderly people (n = 230)

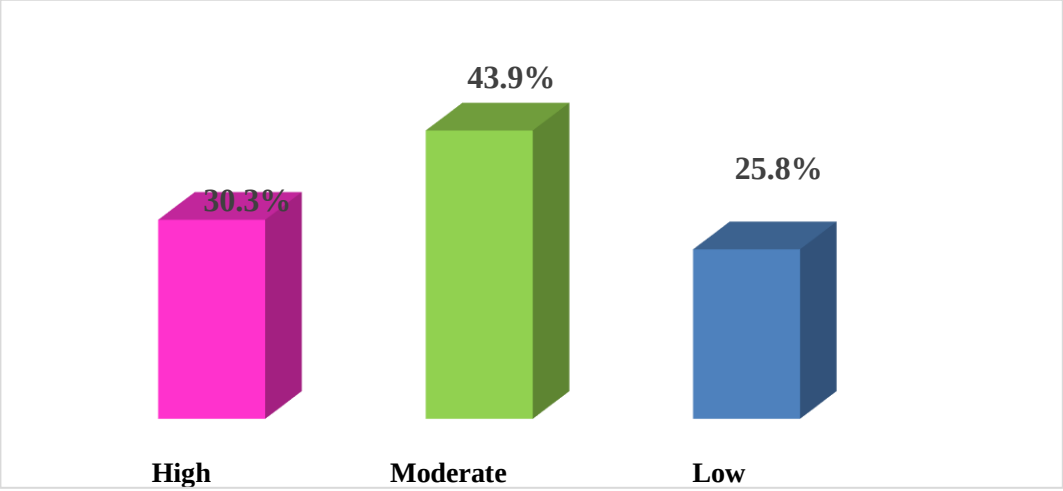

Figure (2): Percentage distribution of the studied elderly according to their total cognitive domains (n=230)

Table (3): Correlation between the studied variable (n=230).

Variables		Total presence of abuse and neglect	Total cognitive domains
1. Total presence of abuse and neglect	**r** **p**		
2. Total cognitive domains	**r** **p**	.524 .02*	

" Pearson correlation is statistically significant at p < 0.01.(**)

Table (4): Multiple linear regression model for the studied elderly` total abuse exposure screening.

Variables	Unstandardized Coefficients		Standardized Coefficients	T-test	P-value
	B	Std. Error	Beta		
(Constant)	2.419	.119		3.511	.001
Marital status	1.984	.013	.423	2.356	.023
Living with (Alone)	1.789	.019	.314	3.789	.014

R Square = .28 *Model ANOVA: F=12.500* *p=0.001*

Table (5): Multiple Linear regression model for the studied elderly` total cognitive domains.

Variables	Unstandardized Coefficients		Standardized Coefficients	T-test	P-value
	B	Std. Error	Beta		
(Constant)	31.12	5.324		4.314	.002
Age	2.452	1.121	.341	3.157	.010
Education level (Low)	-0.928	0.340	.672	6.873	.000

R Square = .22 ***ANOVA model: F=8.134*** ***p=0.00***

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