Cognitive Impairment and Daily Living Activities among Elderly Patients with Stroke at Zagazig University Hospitals

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Abstract

Background: Stroke and cognitive impairment are common in older population. They often occur together, and their combined effects significantly increase disability in both basic and instrumental activities of daily living **Aim of the study:** This study aimed to assess cognitive impairment and activity daily living among elderly patients with stroke at zagazig university. **Subjects and Methods: Research design:** Descriptive design**. Setting:** The study was conducted Zagazig university hospitals at three settings; stroke unit, physical medicine and rehabilitation department, and outpatient neurology clinic **Subject:** A Purposive sampling technique was included 100 elderly patients with stroke. **The tool of data collection** Demographic characteristics of the studied elderly, **Modified Mini- Mental State and Assessment of elderly needs. Results:** 60% of studied elderly patients had moderate cognitive impairment while, 27% of them had normal cognitive function and 13% of them had sever cognitive impairment. Also, the studied elderly patients were totally independent in daily living activities regarding bathing (74%), dressing (73%), toilet (87%), transfer (87%), continence bladder and bowel (88%) and feeding (84%) respectively **Conclusion:** cognitive impairment in elderly with stroke influence the daily living activities, the study presented significant association between the studied elderly`s cognitive ability level and activity performance and defined that significant positive correlation between the studied elderly`s cognitive level and their daily living activities performance. **Recommendations** Improve community awareness through educational messages in mass media on the importance of early deal with stroke patients and how to enhance cognitive performance and daily living activities.

Keywords: Cognitive Impairment, Activity Daily living, Elderly Patients, Stroke

Introduction:

For most people, maintaining general good health requires more effort as they age**.** A stroke is a serious life-threatening medical condition that happens when the blood supply to part of the brain is cut off. Strokes are a medical emergency and urgent treatment is essential **(Richard & Besdine , 2020)**. The incidence of stroke increases with age, with up to 69% of individuals older than 65 years and a prevalence of 34.4% older than 75 years **(Feigin et al., 2012).** More than 13.7million people are estimated to have their first stroke this year 2021, and 5.5 million succumb to stroke every year. It contributes to lost disability-adjusted life years (DALYs) and poses a significant barrier to sustainable social and economic growth **(World Health Organization [WHO], 2021).**

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In Egypt, the overall crude prevalence rate of stroke is high (963\100000 inhabitant), and the incidence of stroke annually is approximately 150000-210000.the official national statistics indicate that diseases of the circulatory system, including stroke , are the primary causes of death in Egypt, where stroke accounts 6.4% of all deaths and ranks third after cardiovascular and gastrointestinal diseases .the percent of population aged above 50 is only 12.7% **(Aref et al., 2021).**

Many stroke survivors are able to recover functional independence over time, but 25% are left with a minor disability and 40% experience moderate-to-severe disabilities. Recent reviews and meta-analyses identified a pooled prevalence of PSCI(Post Stroke Cognitive Impairment) of 53.4% and mild and major PSCI of 36.4–38 and 16% respectively, measured within 1.5 years post-stroke **(Barbay et al., 2018).**

However, Over the past 15-20 years, a growing body of literature has highlighted the significant contribution of stroke and vascular risk factors (such as hypertension, diabetes, obesity, dyslipidemia, Age ,sex, and tobacco smoking) in the development of cognitive decline and dementia **(Srithumsuk etal., 2020)**. Depression after stroke runs a chronic course and is related to increased morbidity and mortality. The best estimates are that approximately one-third of people who have had a stroke will display poststroke depression which in addition to being characterized by low mood **(Singh et al., 2019) .**

As cognitive impairment and dementia have been identified as the strongest expenditure among older and oldest individuals**.** Depressive symptom and cognitive impair rment often co-occur in advanced age, leading to a variety of emotional and physical problems that affect the ability of individuals in work and life and further reduce the quality of life **(Han et al., 2021)**.

After a stroke, patients may struggle with the activities of daily living, which indicates a critical need for rehabilitation to boost independence. Depression and cognitive impairment may either directly or indirectly lead to more significant impairments in daily activities, which require more careful services and institutionalization of stroke patients . The long recovery process following a stroke requires high quality nursing care, especially for elderly people, who become more dependent on others in line with the aging process **(Maher., 2021).**

Gerontological nurses are indispensable in caring for patients with acute and convalescent stroke. In care of stroke patients with cognitive impairment and depression, it requires much of gerontological nurses to provide required care. it was essential not only to provide care for the patients, but also to educate them about self-care; not only to manage the patients' physical condition (blood pressure, blood sugar level, etc.), but also to provide psychological support and be a friend at times. cognitive impairment and depression require much of gerontological nurses to provide required care **(Wei Cheng et al., 2021).**

Significant of the study:

Stroke is the second leading cause of death worldwide and the third most common cause of disability, Stroke is a leading cause of death and disability internationally.

Stroke is an important cause of cognitive impairment, it is now reliably proven that strokes lead to both depression and diminished cognitive ability. On a practical level, impairments in executive functioning have been associated with impairments in activities of daily living which include getting dressed, the ability to feed oneself, bathe oneself and more. Executive functioning ability has been strongly connected to working

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memory ability. Therefore, this study will conduct to evaluate cognitive impairment and depression among elderly patients with stroke at Zagazig University Hospitals.

Aim: The aim of the current study is to assess cognitive impairment and activity daily living among elderly patients with stroke at zagazig university

Research Quotation:

Is there a relation between cognitive impairment and activity daily living among elderly patients with stroke at zagazig university Hospitals?

Subjects and Methods:

Research design:

The descriptive design was used to conduct this study.

Study Setting:

The study was conducted at Zagazig university hospitals at three settings; stroke unit, physical medicine and rehabilitation department, and outpatient neurology clinic in Zagazig City, Sharkia governorate.

Study subjects: A Purposive sampling technique was used in the recruitment of this study subjects from the above-mentioned setting and who fulfilled the study inclusion criteria. The subjects eligible for the present study included 100 elderly patients with stroke.

Undergoing the following criteria:

Elderly patients aged 60 years. Elderly diagnosed of stroke at least (three months duration) documented by CT or MRI brain.

Exclusion criteria

Presence of additional severe medical conditions preventing active rehabilitation (e.g., cardiac failure, severe chronic lung disease necessitating a constant use of oxygen); Patient with disturbed conscious level. Patients receiving anti-psychotic

drugs, antiepileptic. Other causes of dementia rather than stroke.

Tools for data collection:

Tool I: Demographic characteristics of the studied elderly.

It covered questions such as, sex, marital status, and level of education, current occupation, residence and source of income. Besides questions such as, age and number of family members. It included eight questions.

Tool II: The Modified Mini- Mental State Test (3ms) by (Teng&chui, 1987)

This screening tool was used to assess a broader variety of cognitive domains and covers a wider range of difficulty levels. The 3(MS) extended the scope of The Mini-Mental State Examination (MMSE). It is a global measure of cognitive abilities tapping domains such as attention, concentration, orientation, to time and place along term and short term memory, language ability, constructional praxis, abstract thinking, and list generating fluency. Instructions were given verbally; two of the items involve visual stimuli.

Tool III: Assessment of elderly needs

KATZ ADL measures a person's independence in common activities of daily living (ADL). The Index ranks adequacy of performance in six functions: bathing, dressing, toileting, transferring, continence, and feeding. One point means the person is independent; zero points means the person requires supervision, direction, personal assistance or total care.

The Katz Index of Independence in Activities of Daily Living, commonly referred to as the Katz ADL, is the most appropriate instrument to assess functional status as a measurement of the client's ability to perform activities of daily living independently. Clinicians typically use the tool to

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detect problems in performing activities of daily living and to plan care accordingly. The Index ranks adequacy of performance in the six functions of bathing, dressing, toileting, transferring, continence, and feeding. Clients are scored yes/no for independence in each of the six functions. A score of 6 indicates full function, 4 indicates moderate impairment, and 2 or less indicates severe functional impairment.

Scoring system:

Each of these six functions was measured and scored according to the elderly actual performance, and categorized into one of three levels of dependence, these were "totally dependent "scored 3, "Need assistant" scored 2 and " Totally independent " scored 1,so that a higher score indicates more dependence. The scores of the six domains were summed-up, and the total score ranges from 6 to18. According to Katz and Akpom, the total score classified into three categories:

Totally dependent; 10%, Need assistance; 20% and Totally independent: 70%

Validity of the tools

It was established by panel of three expertises from department of community health nursing, one professor of community health nursing, and two professor of medical surgical nursing department who reviewed the instruments for clarity, relevance, comprehensiveness, understanding, applicability and easiness for administrative minor modifications were required and correction was carried out accordingly.

Reliability of the tools:

reliability of the items of the tools was assessed using Cronbach's alpha test, it's results was .818 for 3Ms scale, and .929 for Daily performance.

Pilot study:

A pilot study was conducted before starting data collection to evaluate sensitivity, specificity, clarity and applicability of the questionnaire and to do the necessary modification. Also, to determine the time needed. It was carried out on 10 elderly persons from the previous settings. Analyses of the pilot study revealed that minimal modifications are required. These modifications were done, and the subjects were excluded from the actual study.

Fieldwork:

Once the permission was granted to proceed with the study, the researcher started to prepare a schedule for collecting the data. Each elderly was interviewed individually by the researcher who introduced herself, explained the aim of the study briefly, reassured them that information obtained is strictly confidential, and would not be used for any purposes other than research. After that, the verbal agreement was obtained to collect the necessary data. The researcher used to go to Zagazig University hospitals for interviewing the woman who fulfills the criteria. The study tools were answered by each elderly during the interview, and the time needed ranged from 30 to 40 minutes, according to understanding and cooperation of the woman. The fieldwork was executed over eight months from the beginning of August 2022 up to the end of March 2022; three days per week (Monday, Tuesday, and Wednesday) from 9.00 am to 1.00 pm.

Ethical considerations:

The ethical issues were taken into consideration during all phases of the study. Firstly, the study was approved by the pertinent authority of research ethics committee (REC) of faculty of nursing at Zagazig University. Then, approved was taken by director general of zagazig university hospitals. On the other hand, a

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verbal agreement for participation of the informants was taken after fully explanation of the aim of the study. Participants was given the opportunity to refuse the participation, and they were notified that they could withdraw at any stage of the data collection interviews; also they was assured that the information would be confidential and used for the research purpose only. The researcher assured maintaining anonymity and confidentiality of subjects' data. The researcher phone number and all possible communicating methods were identified to the participants to return at any time for any explanation. An ethical approval from Zagazig university committee was obtained to conduct the study.

Administrative design:

The administrative design implemented through submission of a formal letter containing aim of the study from post-graduate department then referred to dean of faculty of nursing, Zagazig University, followed to general director of zagazig university hospitals to dean of faculty of medicine which in turn referred to general director of zagazig university hospitals for final approval.

Statistical Analysis:

All data were collected, tabulated, and statistically analyzed using the IBM SPSS (Statistical Package for the social sciences) statistics for windows, version 23.0 IBM Corp., Armonk, NY: USA. Quantitative data were expressed as the mean ± SD & (range), and qualitative data were expressed as absolute frequencies (number) & relative frequencies (percentage).

Percent of categorical variables were compared using Chi-square test, Pearson correlation coefficient was calculated to assess relationship between various study variables, (+)

sign indicate direct correlation & (-) sign indicate inverse correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation. All tests were two sided. p- value < 0.05 was considered statistically significant, p and p-value ≥ 0.05 was considered statistically insignificant (NS).

Significance of the results:

Highly significant at p-value < 0.01.

Statistically significant was considered at p-value < 0.05.

Non-significant at p-value ≥ 0.05

Results:

Table (1) reveals that the studied elderly`s mean age was 67.66 ±5.61 years, with more age group (60-69 years)52 % of them were female and 69% were married. As regard residence, 72 % of the studied elderly lived in rural residence. Concerning the studied elderly`s occupation, 95% of them weren`t working and living with their families respectively. Regarding income, 57% of the elderly patients having insufficient income and 43% of them had sufficient income respectively.

Table (2): represents statistically significant positive correlation between the studied elderly`s cognitive level with their marital status with (p = 0.250), residence (p = .250) and education with (p = 0.639). meanwhile, there is statistically significant negative correlation between the studied elderly`s cognitive level with their age (p = -.199), gender (p = -.274) and hospital admission history(p = -.295) and also, statistically significant positive correlation was found between the studied elderly`s daily living activities performance with their marital status (p= .279) and having chronic diseases (p=.207) while there is a statistically significant negative correlation between the studied elderly`s daily

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living activities performance with their age (p=-.337).

Figure (1): presents that 60% of studied elderly patients had moderate cognitive impairment while, 27% of them had normal cognitive function and 13% of them had sever cognitive impairment.

Figure (2) elicits that 70% of studied elderly were totally independent regarding daily living activities performance while, 20% of them needed assistance and 10% of them were totally dependent respectively.

Table (3): presents the best fitting multiple linear regression model for 3(MS) score. It indicates that elderly`s residence and educational level are statistically significant in dependent positive predictors of 3(MS) score on other hand ,hospital admission is Statistically significant independent negative predictor pf 3(MS)score. However, it explains 52% of the variation in the score as evident from the r-square value

Table (4): presents the best fitting multiple linear regression model for daily activities performance score. It indicates that elderly`s age and total depression score are statistically significant in dependent negative predictors for daily activities performance score. However, it explains 35% of the variation in the score as evident from the r-square value.

Discussion:

As people age, their risk of stroke complications and mortality rises, impairing patients' quality of life. Patients and their caregivers are significantly impacted by nursing care (**Abd-Elkhalik et al., 2023**). As cognitive impairment and dementia have been identified as the strongest expenditure among older and oldest individuals. Depressive symptom and cognitive impairment often co-occur in advanced age, leading to a variety of emotional and physical problems that affect the ability of individuals in

work and life and further reduce the quality of life (**Han et al., 2021**).

Gerontological nurses are indispensable in caring for patients with acute and convalescent stroke. In care of stroke patients with cognitive impairment and depression, it requires much of gerontological nurses to provide required care. It was essential not only to provide care for the patients, but also to educate them about self-care; not only to manage the patients' physical condition (blood pressure, blood sugar level, etc.), but also to provide psychological support and be a friend at times. Cognitive impairment and depression require much of gerontological nurses to provide required care (**Wei Cheng et al., 2021**).

Therefore, the aim of the current study is to assess cognitive impairment and depression among elderly patients with stroke at Zagazig University hospitals.

In term of Age of the studied elderly patients; the findings of this study indicated that less than three quarters of the studied elderly patients aged from **60 to 69 years** and mean age was 67.66 ±5.61 years**.** This may be because the risk of stroke rises with age, which can signal the start of a sedentary lifestyle and several physiological changes, such as brain blood vessel narrowing. The previous findings were in the same line with those of other previous study in Jordan carried out **by Alawneh et al., (2022)**) who revealed that about three quarters of the studied elderly patients aged from **60 to 69 years** old and mean age 67.8 ± 12.2 years old.

In term of sex of the studied elderly patients in the current study, females were more prevalent than males. This finding might be due to the increasing number of women age estrogen is not able to produce more of High-Density Lipoprotein, so most likely the occurrence of

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thickening of the arteries (atherosclerosis) due to increased Low-Density Lipoprotein.

Likewise, the finding of study conducted in Iran by **Hekmatpou et al., (2019**) who found that most of the studied patients were females. On other hand, this result disagreed with study done in Kashan by **Dianati et al., (2021**) who reported that less than two thirds of the studied patients were males.

Concerning to **Residence of** the studied elderly patients, the present study showed that less than three quarters of them lived in rural residence. The finding disagreed with study done in Cairo by **El Sayed, & Ewees, (2020**) who revealed that less than two thirds of the studied patients lived in urban residence.

Pertaining to marital status of the studied elderly patients, the present study showed that more than two thirds of the studied patients were married. This might be due to the high daily problems and stress on married patients compared to single patients, which was a risk factor for hypertension. In the same stream, a study conducted in Tabriz by **Salarimehr et al., (2018)** who found that most of the studied patients were married.

With regards to the level of education of studied elderly patients, the present study findings explained that less than two thirds of them didn`t neither read nor write. In comparison, secondary education was less than one quarter. This result might be due to around three quarters of the study participants living in rural area, where there is no interest in education. Similarly, the pervious study results agreed with a study conducted in Chine by **He et al., (2022)** , to investigate the incidence of PSCI in first-ever ischemic stroke Chinese, summarized Previous that, lower education level was linked to an increased risk of stroke.

On other hand, this finding disagreed with study carried out by **Zamzam et al. (2020)** in Sebelas Maret who conducted their study to analyze the determinants of the quality of life of patients post stroke and found that that less than two thirds of the studied patients had secondary education, in comparison, didn`t read nor write just 2.0%

Regarding to current occupation of the studied elderly patients, the current study showed that the majority of them are not working currently. This might be due the values of the elderly patient, as old age was a time to relax rest and come closer to God and worship, and that they achieved their duty in their lives. This result was consistent with those studies conducted by **Algameel et al (2021)** in Saudi Arabia and showed that about three quarters of the studied elderly patients are not working currently.

Regarding **Month Income** of the studied elderly patients, more than half of them have insufficient month income. The previous finding agreed with a study conducted in *Port Said* by **Mohammed, (2019)** who revealed that most of the studied patients have not enough monthly income.

In relation to **Total elderly's cognitive level**, the present study revealed that illustrates that less than two thirds of studied elderly had moderate cognitive impairment while, about one quarter of them had normal cognitive function and more than one tenth of them had sever cognitive impairment. This result in same line with study done in Austria by **Brainin et al. (2015)** who showed that less than three quarters of the studied patients had moderate cognitive impairment. Also, this confirmed study in Minia by **Abdelbaky et al., (2022)** who revealed that more than three quarters of the study patients had moderate cognitive impairment while, about one

tenth of them had normal cognitive function and one tenth of them had sever cognitive impairment.

Conversely, this finding disagreed with study carry out in Egypt by **Abd Allah et al., (2021)**, who revealed that half of the study participants had severe cognitive impairment.

As regards to Daily living activities performance among the studied elderly patients, the present study revealed that less than three quarters and most of the studied elderly had total independent daily living activities regarding bathing, dressing, toilet, transfer, continence bladder and bowel and feeding respectively. On other hand, this finding disagreed with study done in Benha by **Taha & Ibrahim, (2020)** who stated that most of the studied patients had Need assistance in all items Daily living activities performance.

Regarding to Total Daily living activities performance among the studied elderly, the current study elicited that less than three quarters of studied elderly were totally independent regarding daily living activities performance while, one fifth of them needed assistance and one tenth of them were totally dependent. The previous findings were in the same line with those of other previous study in Egypt carried out by **Aboalizm & Gad, (2021)** who revealed that less than one tenth of studied patients were totally dependent.

On other hand, this finding disagreed with study done in Assuit by **Abd-Elaziz et al.,**

(2015) who showed that about one third of studied elderly were totally dependent regarding daily living activities performance while, more than half of them needed assistance.

Conclusion:

Based upon the findings of the present study it was concluded that cognitive impairment and depression in elderly with stroke influence the daily living activities, the study presented significant association between the studied elderly`s cognitive ability level and activity performance and defined that significant positive correlation between the studied elderly`s cognitive level and their daily living activities performance.

Recommendation:

On the basis of the current study findings, the following recommendations are suggested:

- To implement an educational program about enhancing cognitive performance between elderly with stroke
- Further studies to assess effect of cognitive impairment on quilty of life in elderly patients with stroke
- It is recommended that the post stroke units should have psychotherapist to improve post stroke depression ealy to improve daily living activities
- Improve community awareness through educational messages in mass media on the importance of early deal with stroke patients and how to improve psychological status and daily living activities.

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Table 1: Demographic characteristics of the studied elderly patients (N=100)

Demographic characteristics	(n=100)	
	Frequency	**Percent**
Age group: /year		
60-69	69	69.0
70-79	26	26.0
≥ 80	5	5.0
Mean ± SD **(range)**	**67.66 ± 5.61** **(60 – 83)**	
Gender:		
Male	48	48.0
Female	52	52.0
Residence:		
Rural	72	72.0
Urban	28	28.0
Marital status:		
Married	69	69.0
Unmarried [divorced-widow]	31	31.0
Current occupation:		
Work	5	5.0
Not work	95	95.0
Living with whom:		
Alone	5	5.0
With family	95	95.0
Income:		
Sufficient	43	43.0
Insufficient	57	57.0

Table (2): Correlation between 3(MS), depression level and daily living activities performance scores and elderly characteristics

Scores	Spearman's rank correlation coefficient	
	3(MS) Cognitive level	Daily living activities performance
Age	-.199*	-.337**
Gender	-.274**	-.116
Marital status	.250*	.279**
Education	.639**	.029
Residence	.250*	.014
Have chronic diseases	-.107	.207*
Last year hospital admission	-.295**	-.136
Stroke time	-.146	.007

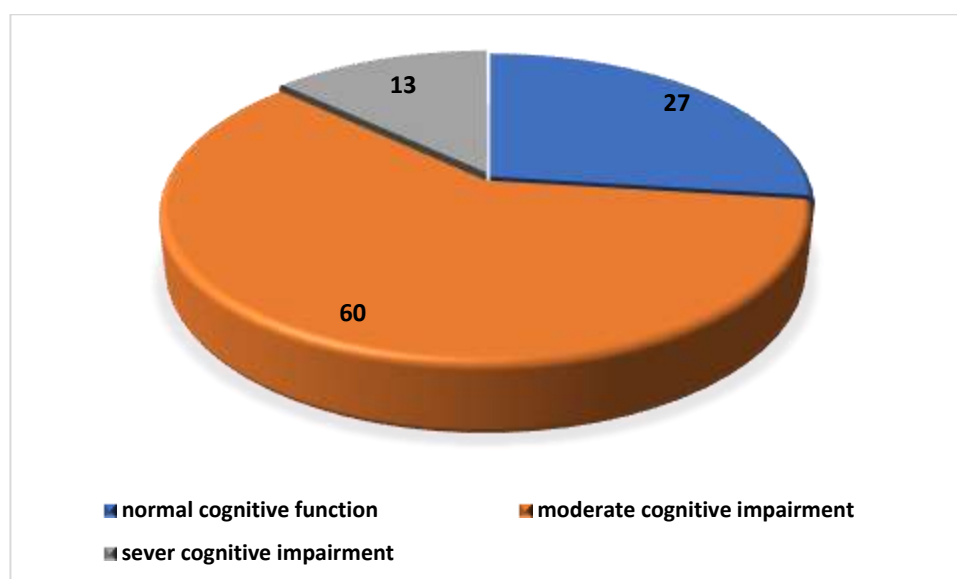*(*) Statistically significant at p<0.05   (**) statistically significant at p<0.01*

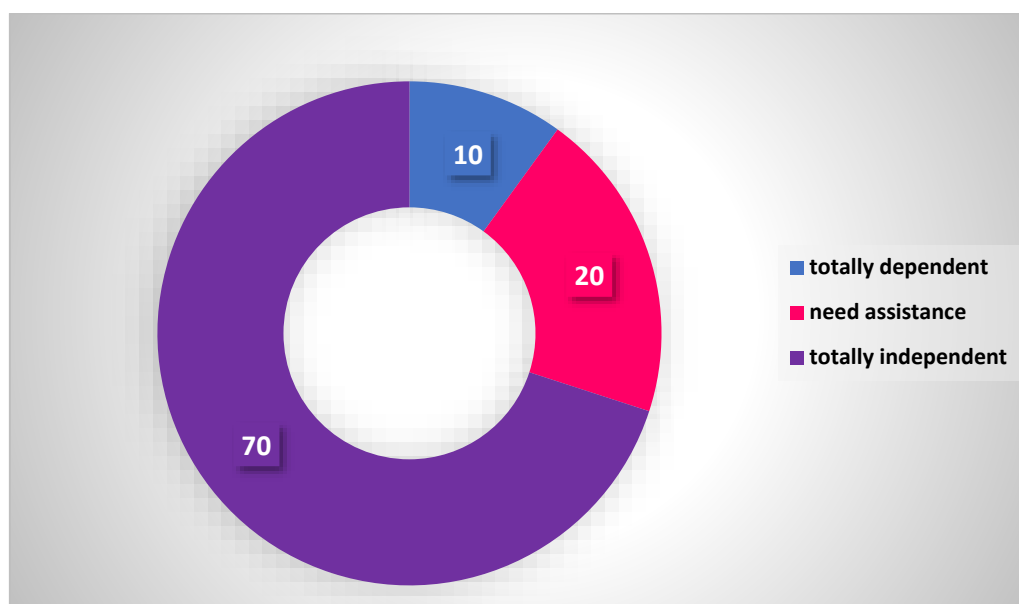**Fig. (1): cognitive level among the studied elderly patients (n=100)**

Fig. (2): Activities performance among the studied elderly patients (n=100)

Table (4): Best fitting multiple linear regression model for the 3(MS) score

Items	Unstandardized Coefficients		Standardized Coefficients	T	Sig.	95% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	49.939	10.449		4.779	.000	29.192	70.685
Gender	-2.972	2.159	-.109	-1.377	.172	-7.259	1.314
Residence	5.368	2.320	.178	2.314	.023	.762	9.974
Marital status	2.364	2.215	.081	1.067	.289	-2.034	6.761
Educational level	4.367	.667	.533	6.545	.000	3.042	5.691
Admitted hospital last year	-5.491	2.331	-.173	-2.356	.021	-10.119	-.863

R-square=0.52   Model ANOVA   F=20.055,   p<0.05

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Table (5): Best fitting multiple linear regression model for daily activities performance score

Items	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95% Confidence Interval for B	
	B	**Std. Error**	**Beta**			**Lower Bound**	**Upper Bound**
(Constant)	7.544	3.349		2.252	.027	.893	14.195
Age	-.072	.032	-.208	-2.282	.025	-.135	-.009
Marital status	.519	.371	.123	1.401	.164	-.217	1.256
Chronic diseases	.800	.949	.090	.843	.402	-1.085	2.684
No. of diseases	-.024	.426	-.006	-.057	.954	-.870	.821
Total 3ms score	.025	.014	.177	1.791	.077	-.003	.054
Total depression	-.143	.047	-.307	-3.020	.003	-.237	-.049

R-square=0.35   Model ANOVA   F=8.29   p<0.05

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