Effect of Health Educational Program on Early Detection of Alzheimer Disease among Elderly patients with Diabetes type II

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Abstract

Background: Diabetes type II is one of the most serious health challenges as it affects both human and material resources. Due to its complication, there were varying degrees of disability, a decline in survival, a drop in living standards, and an increase in the financial load on the individual and family. **Aim of study**: evaluate the effect of health education program on elderly with diabetes type II for early detection of Alzheimer disease (Diabetes type III). **Subjects and Method:-Study design:** A quasi-experimental study **Subjects**: A convenience sample of 105 elderly with diabetes type II **data Tools collection: Tool (I): A structured schedule**. Part I: Bio-socio-demographic features of elderly with type II diabetes. Part II: Medical history. Part III: Knowledge of the elderly patient about type II diabetes (Diabetic Knowledge Test DKT). **Tool (II):** Diabetes Self-Management Questionnaire (DSMQ) **Tool III:** King's Health Questionnaire (KHQ) **Tool (IV):** Mini – Mental State Examination (MMSE)**. Tool (V):** physical assessment**. Results:** Greater than two-thirds of the studied elderly has lower level of knowledge about diabetes before intervention while two-thirds of elderly acquired high level of knowledge about it after intervention. Most of the studied elderly had low level of knowledge about Alzheimer disease before intervention while almost three-quarters of them had high level of knowledge about it after intervention. **Conclusion and recommendation:** greater incidence of minor cognitive impairment going undetected in type II diabetics. Efforts should be done to enhance knowledge and practical skills of the diabetic patients and their family.

Key wards: Diabetes type II, Alzheimer disease

Introduction

Diabetes mellitus is among the most common long-term medical conditions which can lead to serious complications affecting quality of life and life span. Because diabetes uses up a lot of material and human resources, it has become one of the biggest health problems in the globe threatening advanced and developing nations (**Mangione, C., Brown, A., Saliba, D., & Sarkisian, C.2021).**

The World Health Organization (WHO) defines diabetes mellitus as a metabolic illness with much etiology defined by persistent hyperglycemia with changes in carbohydrate, lipid, and protein metabolism resulting from deficiencies in insulin production, insulin action, or both. **(WHO., 2022).** The International Diabetes Federation (IDF) determined the incidence of diabetes was over 422 million people globally and that it will rise to 642 million by 2040, making the disease 6th leading cause of death in 2030. (**IDF., 2021).**

The Central Agency for Public Mobilization and Statistics (CAPMAS) in Egypt provided the following data; there were 39 million type II diabetes in the country as of 2019, with 8.6 million of those being old. **(CAPMAP. 2021).** If diabetes is not properly managed, Egypt's incidence of the disease, which is currently ranked tenth globally, is predicted to double by 2045 to rank sixth globally. **(Nguyen, T.h., Hoai, Q., & Giau, V. 2020).**

The most prevalent type of diabetes is type II. Worldwide, millions of individuals have received a Type II diabetes diagnosis, yet many more go unidentified. If their diabetes is poorly managed or goes untreated, people with the condition are more likely to get heart attacks and strokes. (**Mohammedi K, et al., 2019 and Rhea, E., & Banks, W. 2019).** When a person has type II diabetes, their cells either reject insulin or the body does not create enough of it. The body needs insulin in order to utilize glucose as an energy source. (**Barrett E, et al., 2020).**

On the other hand, type III diabetes (T3DM) is a different kind of diabetes that was very recently identified. This novel variety presents as insulin resistance in the brain, and it has the potential to significantly affect neuro-cognition and play a role in the development of Alzheimer's disease. **(Weng, H., Hung, C., Chi, S. 2020).** Alzheimer's disease is currently 6th most common cause of mortality in the United States, and 5th leading reason of mortality among elderly over the age of 65 years old. **(Wang X, et al., 2021)**. There is no present cure, although treatments for symptoms are available, and research continues. **(American Diabetes Association, 2020).**

Alzheimer's disease is a degenerative neurologic illness that results in the death of brain cells and atrophy of the brain. The most prevalent cause of dementia, which impairs a person's capacity for independent living, is Alzheimer's disease. Dementia is characterized by a progressive loss of intellectual, behavioral, and social skills. **(Konstantina G & Sokratis G, 2020).** The inability to recall recent conversations or occurrences is one of the disease's early symptoms. A patient with Alzheimer's disease will have significant memory loss and lose their capacity to carry out daily chores as their condition worsens. (**Bondi, W., Edmonds, C., & Salmon, P.2019).** Community health nurses play important roles in diabetes prevention and treatment, and they are responsible for educating

diabetics about self-care, nutrition, and overall disease management. Community health nurses must improve public knowledge about diabetes in order to encourage early detection of signs and avoid Alzheimer's. **(Vjera, A., Ferris, S., & Ralf, I. 2020).**

Significance of the Study; Diabetes can lead to a variety of serious consequences that raise morbidity, mortality, and healthcare costs. Type II diabetic complications are the most common

The aim of the study is to: Evaluate the impact of health education program on older patient with diabetes type II for early detection of Alzheimer disease (Diabetes type III).

Research Hypothesis:-

Early detection of Alzheimer disease among elderly with diabetes type II are expected to be increased after implementation of health education program.

Subject and Method

Study design: A quasi-experimental design was utilized to perform this study.

Study setting: This study was conducted at the diabetes outpatient clinic at Tanta University Hospital and the medical outpatient clinics at the Health Insurance Hospital.

Study subjects: A convenience sampling of 105 elderly with diabetes mellitus type II was participated in the present investigation. The sample was selected from elderly diagnosed with type II diabetes mellitus attending the previous settings.

Inclusion criteria for the elderly:

Both sexes, aged 60 years or above of older adult and have type II diabetes mellitus for minimum six months, able to communicate appropriately, don't suffer problems seen around the world. One of these complications is Alzheimer that could be prevented or managed by proper diet, exercise and life style modification of the elderly. Though, the community health nurse should determine the perceived standard of life for the purpose of support the formation of a proactive attitude of older person with diabetes type II toward the early diagnosis of Alzheimer disease. (**Creavin S, et al., 2020 and Abate, T. W., et al., 2022)** from any mental disease and agree to involve in the investigation**.**

Tools of collecting data: This study's data collection involved the use of six tools.

Tool (I): A structured interview schedule: involved these parts:

Part (1): Bio-socio-demographic characteristics of the older patient with type II diabetes mellitus: The researcher created this instrument by consulting existing literature. This section was involved data about age, gender, marriage condition, level of education, present or past work, and residence, family income and care givers income of the elderly.

Part (2): history of medical condition of the older patient with type II diabetes mellitus:-It was contain the following:

Present and past medical history of the older patient was involved: frequency and reason of past hospital admission, duration and onset of DM type II, family history of DM, types and blood tests used such as ; (fasting blood sugar, post prandom after two hours, cumulative sugar test and insulin resistant test), type of treatment and medications received. History was also included compliance with ordered medication, the protocol used to control of diabetes, follow diabetic diet and exercise and also questions about the predisposing

factors (obesity – family history- unhealthy diet- lack of exercise) and follow up.

Part (3): Knowledge of the older patient about diabetes mellitus type II (Diabetic Knowledge Test DKT)

The Michigan Diabetes Research Training Center (MDRTC) created this query in 2017 for the reason of measuring the knowledge of older patient about diabetes type II and Alzheimer disease. It was adapted by the researcher to suit the Egyptian participant. **(Brown, R. 2017)**

Scoring system related to elderly's knowledge

Each element of the knowledge was coded as: Correct and complete response coded as (2), Correct and incomplete response coded as (1), Incorrect response or a "don't know" coded as (zero).

The overall degree was derived by adding the degrees for all components. A higher degree implies a greater understanding of diabetes type II and Alzheimer's disease.

The total score of knowledge about diabetes type II was determined as: Higher knowledge: ≥70% of all knowledge grades. Moderate knowledge: 50-<70% of all knowledge grade. Lower knowledge: <50% of all knowledge grades.

Tool (II): Diabetes Self-Management Questionnaire (DSMQ) regarding reported practices of elderly with type II diabetes mellitus: The DSMQ was created by the Diabetes Academy Institute for Research Mergentheim in 2013 was adapted by the researcher to suit the Egyptian participant. It is the initial German tool; it was intended to evaluate metabolic control behaviors within standard treatment regimens for type II diabetes in older adults, with a focus on diabetes self-care. **(Schmitt, A., Gahr, A., Hermanns, N., Kulzer, B, 2013)**

The degrees for each practice were determined as the following: Done was take "one", not done was take "zero". Grade for all practices was summed up. The total practices score is twelve. A higher score indicated good diabetic self-care practices. It was transferred into a percent score and categorized into: - Unsatisfactory practice: - ≤ 50% (≤ 5) of the total practices score. Neutral: - 50-70 (5-7) of the total practices score. Satisfactory practice: - >70% (> 7) of the total practices score.

Tool III: King's Health Questionnaire (KHQ) that assesses the quality of life of elderly suffers from type II diabetes mellitus: - was modified by the researcher to evaluate the impact of type II diabetes mellitus quality of life. It was composed of 3 sections involving of 21 items.

Section 1; included general health perception and diabetes impact.

Section 2; included eight items, the effect of diabetes mellitus on their life as; Limitations related to roles, physical and social constraints, interpersonal relationships, emotions, sleep and energy levels, and the intensity of urine production.

The responses of KHQ had four point rating system as follows: "never"= 0, "sometimes"=1, "often"=2 and "all the time"=3. The exceptions are the general health perception domain, which has five options: "very good" = 1, "good" = 2, "fair" = 3, "bad" = 4 and "very bad" = 5. And the domain personal connections have the following values: ("not applicable"=0, "not at all"=1, "a little"=2, "moderately"=3, and "a lot"=4); ("ver.

The scoring system part 1&2 of KHQ:-

The total score of all domains equal 76 and divided into; Good functional state had scored less than (37) points (<50%) of the

total score. Fair functional state had scored from 37 to 45 points (50% to < 60%) of the total score. Poor functional state had scored ≥ 46 points (≥ 60%) of the total score.

Part 3; Severity of symptoms which was treated as a single item and comprises ten answers

The scoring system part 3 of KHQ:-The symptom severity scale was graded from 0 (best) to 30 (worst). Mild symptoms have scored less than (18) points (<60%) of the total score. Moderate symptoms have scored from 18 to 22 points (60% to < 75%) of the total score. Severe symptoms have scored ≥ 23 points (≥ 75%) of the total score. **(Volcanoes, s., Lunder, M., & Janez, A. 2023)**

Tool (IV): Mini – Mental State Examination (MMSE):

This Tool was created by **Folstein and McHugh (2016),** it is one of the most frequently used rating instruments in the evaluation of the mental state. It was adapted by the researcher to test cognitive function among elderly patient. It tested elderly orientation, attention, calculation, memory, language and motor skills**. (Creavin, S. et al. 2016)**

Scoring system related to MMSE:-

The individual received zero for incorrect answer and one point for each correct answer. To score, add the number of correct responses. 25-30: No cognitive impairment, 20- < 25: Mild cognitive impairment, 10- < 20: Moderate cognitive impairment, 0- < 10: cognitive impairment that is severe.

Tool (V): physical assessment: This instrument was invented by the researcher. This part was included data about height in centimeters, weight in kilograms to calculate BMI.

Method

Legal and ethical concerns:

Approval of the ethical committee of the Faculty of Nursing was obtained and code (**2022-4-46).**

- All research participants gave their informed consent after receiving a thorough explanation of the purpose of the study.

The study's design did not have a negative impact on any of the sample members.

Privacy and confidentiality were taken into account with regard to the information collected.

The development of the tools

Tool (I) part 1 and 2 was created by the researcher depend on review of the concerned literary works.

Tool (I) part 3 and tool (II) was adapted and translated by the researcher.

Tool (III and IV) of the study was adopted and converted to Arabic, and next was examined for its face and content validity by a jury of five professors' expertise in the domain of Community Health Nursing before performing the study. Validity of the questionnaire represent (100%) for socio-demographic data and health history, 95% for tool II, III, IV and 100% for tool V.

Tool (V) was created by the examiner depend on review of the related literature.

Pilot study: was conducted on ten elderly people in order to evaluate the study instruments' suitability and clarity. Those elderly were involved to the study sample. Depend on the result obtained, no modification was done.

The reliability test was completed for the study instruments using suitable statistical test. **Reliability test of tools** was performed by Cronbach's Alpha exam, which was discovered to be for total questionnaire (0.667), reliability of Diabetic Knowledge Test DKT (0.924),

reliability of Diabetes Self-Management Questionnaire (0.825), reliability of King's Health Questionnaire and reliability of Mini – Mental State Examination ((0.871).

Actual study:

-Meeting the elderly was done in waiting areas or in checkup room in medical outpatient clinics in Hospital of Health Insurance and diabetic outpatient clinics in Tanta University Hospital.

Statistical analysis:

SPSS version 21 was used to statistically analyze the collected data. The range, mean, and standard deviation were computed for numerical values. One-sample T test (T) comparison was performed for qualitative data. Pearson's and spearman's correlation coefficients (r) were used to measure the correlation between variables. At $p<0.01$, the significant level was found.

Results

These Figures (1, 2, 3 & 4) displays the spread of the studied older person with type II based on their sex, their educational level, and their medical history of chronic disease and their duration of diabetes disease. The figure displays that greater than half (57.7%) of the examined older patient were females and 42.8% of them were males, (61.9%) of studied older patient were Illiterate/read and write and the minority of older patient had Secondary education, less than half of them (42.8%) had previous medical history of cardiac disease and 21.9% of them had previous medical history of others as (thyroid gland disorder and hypotension) and 23.8 % of the studied older patient had previous history of hypertension, greater than one – third (33.3%) of them was complained from diabetes more than 15 years and (27.6%) of them less than 5 years while 22.4% of them complain 5<10 years.(Figures 1,2,3 &4) respectively.

Figure (5) Total knowledge level of the studied older patient about diabetes type II before and after performing of nursing intervention program. The figure illustrate that; more than three-quarters (76.2%) of the studied older patient have lower level of knowledge about diabetes disease and 16.2 % of older patient have moderate level of knowledge about type II diabetes disease before intervention, while two-thirds (66.7%) of the older patient acquired higher knowledge level about diabetes disease after intervention.

Table (1) represents distribution of the older patient with diabetes type II by mean and stander deviation of Alzheimer knowledge level before and after intervention. The table represents that, most (85.7%) of the studied older patient possessed low level of knowledge about Alzheimer disease before intervention and 7.6 % of them acquired moderate degree of knowledge about Alzheimer disease before intervention on the other hand less than three-quarters (70.5%) of the examined elderly had acquired high degree of knowledge about Alzheimer disease after intervention.

Figure (6) shows distribution of the studied older patient depending on their practice about Diabetes self - Management Questionnaire (DSMQ): The figure illustrates that most (95.2%) of the older patient had unsatisfied self-management practice before intervention while more than two-thirds (72.4%) of the studied participants had satisfactory self-management practice after intervention. With (17.34+3.45) mean and stander deviation before intervention and improved to (19.92+5.42) after intervention.

Table (2) represents of the older patient distribution with type II diabetes depending on their mean and stander deviation of quality of life level before and after intervention. It illustrates that before intervention the majority of the older patient had poor functional state represent (88.6%) from the studied elderly. On the other hand less than two-thirds (61.9%) of the studied elderly were in good functional state after intervention of educational program while (65.77+11.47) mean and SD before intervention and improved to (37.71+9.22) after intervention.

Table (3) represents distribution of the studied older patient with diabetes type II depending on mean and stander deviation of mini-mental state level before and after intervention. It illustrates that the highest frequency rate was among elderly whom their mini-mental state level (35.2% & 54.3%) respectively of the studied elderly had no cognitive impairment prior and following educational intervention respectively and (33.3% & 25.7%) of the studied elderly had mild cognitive impairment before and after intervention respectively. Regarding the mean and SD of the studied elderly about their mini-mental state level was improved in after than before intervention represent (27.18+3.38 and 22.24+4.77) respectively.

Table (4) represents correlation between age of the examined older patient with type II diabetes and their knowledge about diabetes and Alzheimer disease, self-management, quality of life, severity of diabetes and mini-mental state. The table reveals that; the older people in the study had a statistically significant negative association between their quality of life and age in years. (r =1 0.220 and P= 0.024) while there was positive link among their age and mini mental state (r = 0.272 and P = 0.005).

Table (5) Correlation between duration of diabetes in years of the examined older patient with type II diabetes and their knowledge about diabetes and Alzheimer disease, self-management, quality of life, severity of diabetes and mini-mental state. The table represents that, there are no statistical correlation among duration of diabetes in years and their knowledge of diabetes and Alzheimer, quality of life, severity of diabetes and mini-mental state while; a statistical relationship was observed between the length of diabetes and self-management.

Table (6) represents comparison between gender mean and stander deviation of the examined older patient with type II diabetes and their knowledge about diabetes mellitus & Alzheimer, self-management, quality of life, severity of diabetes and mini-mental state. The table shows that there was a relationship that was statistically significant between older patient gender and their Self-management their mean and stander deviation was represent (-0.23+ 4.02 and 3.51+ 6.88) in males and females respectively

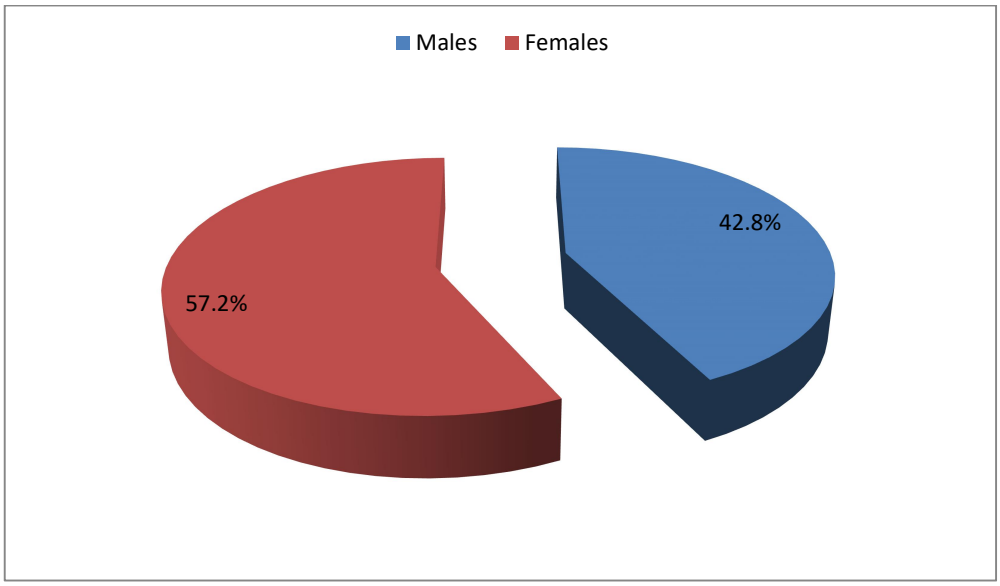


Figure (1): Distribution of the older patient with diabetes type II depending on their sex (n-105)

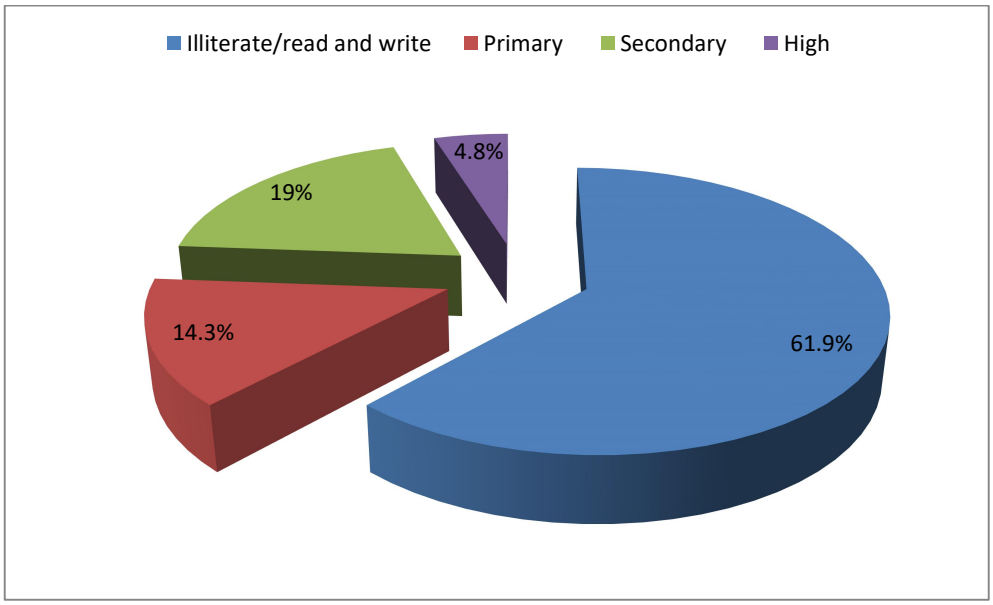


Figure (2) Distribution of the older patient with type II diabetes depending on their educational level (n -105)

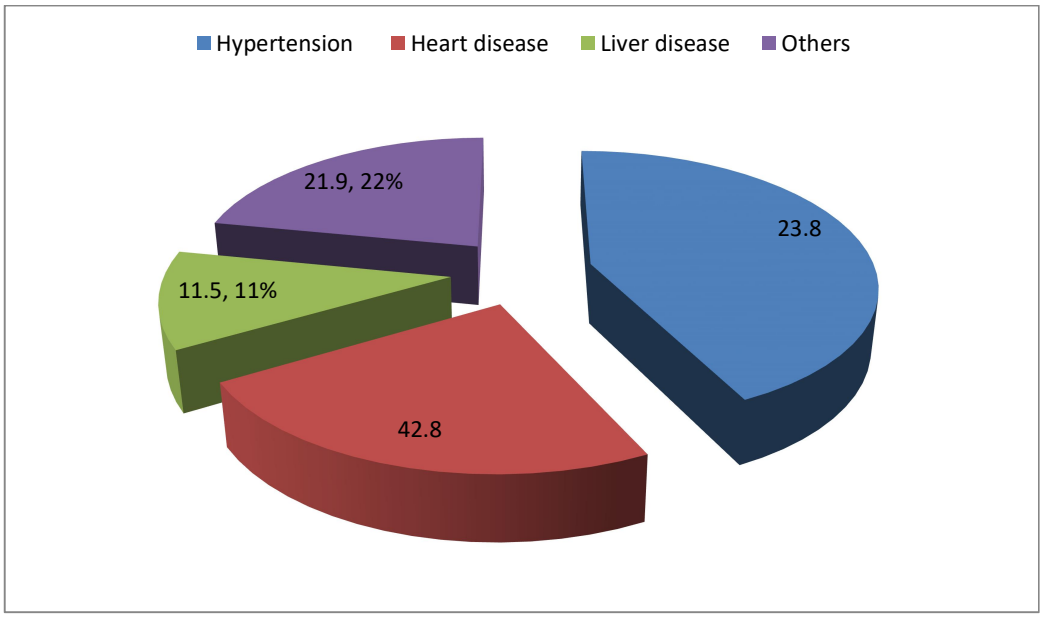


Figure (3) medical history of chronic disease of the older patient with type II diabetes (n -105)

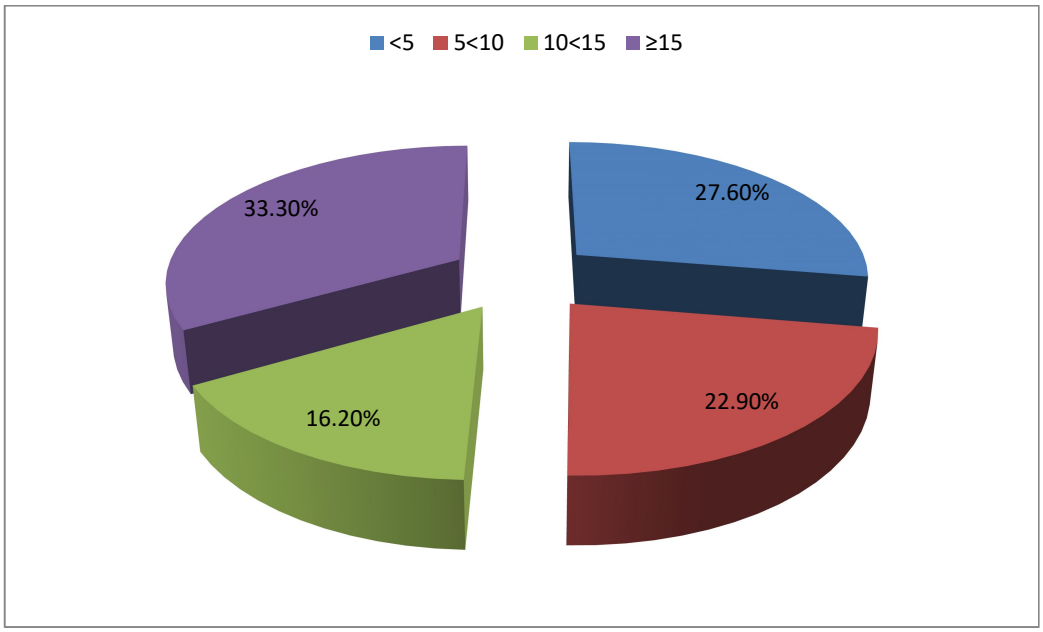


Figure (4) Duration of diabetes of the older patient with type II diabetes (n -105)

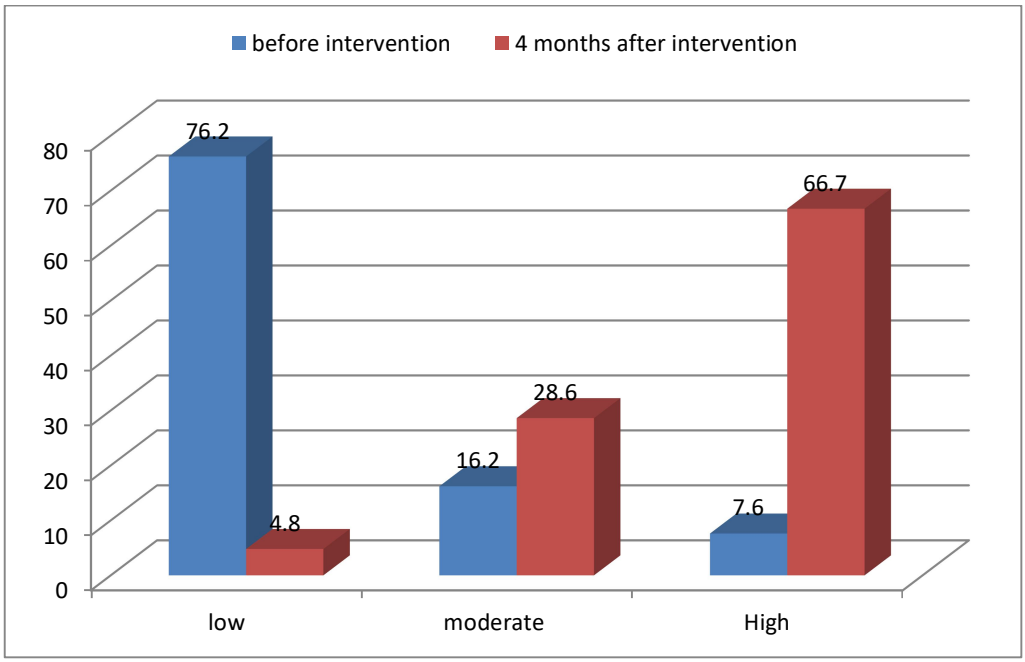
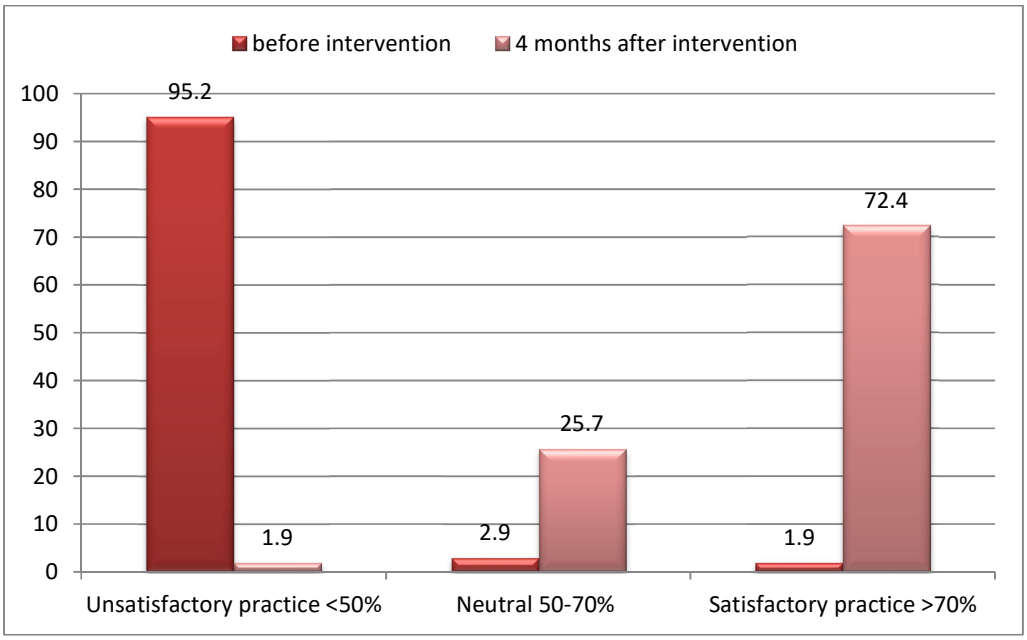


Figure (5): Total knowledge level of the elderly about type II diabetes before and after implementation of nursing intervention program (n-105).

Table (1): Mean and stander deviation of the studied elderly with type II diabetes about Alzheimer knowledge level before and after intervention

Alzheimer knowledge level	Before intervention		After intervention	
	N	%	N	%
Low < 50%	90	85.7	5	4.8
Moderate 50-<70%	8	7.6	26	24.7
High ≥ 70%	7	6.7	74	70.5
Range	0-6		7-12	
Mean±SD	1.49±1.54		10.83±1.10	
T	48.090			
P	<0.001*			

*Significant



Total self-management level among the elderly before and after intervention program n=105)(

Table (2): Distribution of the older patient with diabetes depending on their mean and stander deviation for level of quality of life before and after intervention

Level of quality of life	Before intervention		After intervention	
	N	%	N	%
Poor functional state ≥ 60%	93	88.6	6	5.7
Fair functional state 50-<60%	7	6.7	34	32.4
Good functional state <50%	5	4.7	65	61.9
Range	38-76		20-59	
Mean±SD	65.77±11.47		37.71±9.22	
T	19.366			
P	<0.001*			

*Significant

Table (3): Distribution of the older patient with type II diabetes according to mean and stander deviation of mini-mental state level before and after intervention.

Mini-mental state level	Before intervention		After intervention	
	N	%	N	%
Severe cognitive impairment 0-< 10	0	0.0	0	0.0
Moderate cognitive impairment 10 < 20	33	31.4	21	20
Mild cognitive impairment 20-< 25	35	33.3	27	25.7
No cognitive impairment 25-30	37	35.2	57	54.3
Range	14-30		19-30	
Mean±SD	22.24±4.77		27.18±3.38	
T	8.704			
P	<0.001*			

*Significant

Table (4): Correlation between age of the older patient with type II diabetes and their knowledge about diabetes and Alzheimer disease, self-management, quality of life, severity of diabetes and mini-mental state

Variables	Age in years	
	R	P
Knowledge of diabetes	0.186	0.057
Knowledge of Alzheimer	0.079	0.420
Self-management	0.044	0.655
Quality of life	-0.220	0.024*
Severity of diabetes	-0.140	0.155
Mini-mental state	0.272	0.005*

*Significant

Table (5): Correlation between duration of diabetes in years, and level of knowledge, self-management, quality of life, severity of diabetes and mini-mental state

Variables	Diabetes's duration in years	
	r	P
Body mass index	0.105	0.100
Knowledge of diabetes	-0.162	0.099
Knowledge of Alzheimer	-0.142	0.148
Self-management	0.294	0.002*
Quality of life	-0.109	0.266
Severity of diabetes	-0.043	0.660
Mini-mental state	-0.123	0.212

*Significant

Table (6): Comparison between gender mean and stander deviation of the older patient with diabetes type II and their knowledge about diabetes mellitus & Alzheimer, self-management, quality of life, severity of diabetes and mini-mental state

Variables	Gender		T	P
	Males	Females		
Knowledge of diabetes	22.42±7.58	24.70±6.72	1.449	0.150
Knowledge of Alzheimer	9.73±1.99	9.20±1.98	1.177	0.242
Self-management	-0.23±4.02	3.51±6.88	3.381	0.001*
Quality of life	-26.27±+13.84	-28.65±15.20	0.706	0.482
Severity of diabetes	-2.31±6.51	-3.54±6.99	0.795	0.428
Mini-mental state	3.54±5.01	5.41±6.02	1.426	0.157

*Significant

Discussion

Diabetes is a major cause of morbidity and mortality and a burden to the overstretched health services, community, family and people with the disease. Self- care management is a cornerstone of diabetes care **(Sun H, et al., 2022)**. Internationally, diabetes type II is the most prevalent form of diabetes, affecting 85–95% of all diabetics in High-Income Countries (HICs). The number of people living with diabetes over the age of 65 years will be 253.4 million in 2045.This is being driven by demographic changes including the ageing of the population (**Nishikawa, H et al., 2021)**.

The findings of the current investigation also displays that greater than three-quarters (76.2%) of the older patient had low score of knowledge about diabetes disease and (16.2 %) of them acquired moderate level of knowledge about type II diabetes disease before intervention, while two-thirds (66.7%) of the studied elderly acquired higher level of knowledge about diabetes disease after intervention. **(Figure 5)**. This result is consistent with a study **by Mohamed K et al. (2021)** that examined how an instructional program affected patients' knowledge of adhering to the treatment regimen for type II diabetes mellitus. They found that, after implementing the program, 84.9% of his sample achieved a satisfactory score level for overall knowledge.

In relation to total Alzheimer knowledge level of the examined elderly patient, most of the elderly had low level of knowledge about Alzheimer disease before intervention while almost three-quarters (70.5%) of the studied elderly had acquired higher level of knowledge about Alzheimer disease after intervention. Mean$\pm$SD of the studied elderly before intervention was 1.49$\pm$1.54 and after intervention was 10.83$\pm$1.10. There is significant improve knowledge of the studied elderly before and after program **(Table 1)**. This result was in consistent with the study performed by **Chowdhury S. (2022)** according to a study titled "Knowledge of Alzheimer's disease and its Relation with Attitude towards Genetic Testing for the Disease: A Survey of the General Public in Bangladesh," and indicated that most of people have insufficient understanding and awareness of Alzheimer's disease.

Regarding self-management, the majority of the studied older patient had unsatisfied self-management practice prior intervention while more than two-third of the participants had satisfactory self-management practice after intervention. **(Figure 6)**. This findings was in disagreement with the study performed by **Zulkarnaini et al. (2022**) who examined how diabetes self-management education affected the diabetes mellitus patients' self-efficacy in the Puskesmas Kota Langsa and found that, compared to before the program, most respondents (84%), up from 64% previously, demonstrated high category self-efficacy. This discrepancy can be the outcome of the participants' high degree of illiteracy and the disregard for healthy conduct in society.

Concerning mini-mental state level for 35.2% of the studied participant had no cognitive impairment and 33.3% of them had Mild cognitive impairment

before intervention while more than half (54.3%) of the older patient had no cognitive impairment after intervention. **(Table 3).** This finding was different from the study performed by **Abdul MUNIF M. et al.(2022)** who studied relation between risk factors and cognitive impairment among type II diabetes mellitus patients and reported that (55.70%) of elderly with type II diabetes had Mild cognitive impairment (MMSE score ≤ 23) and (44.30%) had normal cognitive function (MMSE score ≥24).

Regarding relation between age and quality of life, there was a statistically significant negative correlation between the studied elderly age in years and their quality of life this mean that with increase age associated with decrease quality of life **Table (4).** This study in consistent with the study performed by **AbuAlhommos A etal. (2022)** who conducted research on the health-related quality of life of type II diabetes patients in Saudi Arabia and found that, because the disease lasts longer, age has a negative correlation with patients' quality of life.

Regarding relationship between mini-mental scale and age, a statistically significant correlation was seen between the mini mental state and age in years. **Table (4)**. This result was consistent with research by **Abdul MUNIF M. et al. (2022)**, which found a weakly positive connection between MMSE, age, body mass index, and postprandial blood sugar.

The study showed that there are no statistical correlation between duration of diabetes in years and their quality of life **(Table 5)**. This result was different from the research performed by **Jing et al**., **(2019)** who conducted a systematic review and meta-analysis on parameters connected to type II diabetes patients' quality of life and found that patients' quality of life declined with the length of their disease. And also different from the study performed by **Glasgow et al**., **(2019)** who studied quality of life and related factors in a sizable nationwide sample of persons with diabetes and found that type II diabetics with longer diabetes histories had lower quality of life. This difference due to cultural and religious acceptance of disease.

Finally, concerning relation between self-management and length of the diabetes, there was significant relation between self-management and length of the diabetes **Table (5)**. This finding in consistent with the research done by **Abate T et al., (2021) who** examine adult diabetics' non-adherence to self-care and related factors in Ethiopian: According to a systemic review and meta-analysis, adherence to T2DM self-care and duration were significantly correlated. For the best chance of success, individuals recently diagnosed with diabetes must acquire both more advanced knowledge and basic abilities.

In the present study there is no significant relationship between mini-mental scale and duration of the diabetes **Table (5)**. This result was in line with the study performed by **Abdul MUNIF M. et al. (2022)** who studied association between risk factors and cognitive impairment among type II diabetes mellitus patients and reported that no evidence of link between diabetes duration of diabetes and mini-mental state.

This research revealed that, there was significant association among elderly gender and their Self-management in males and females respectively **Table (6)**. This result was in agreement with the research performed by **Aga F et al., (2019)** who illustrate that self-management is significant difference among male and female. While in disagreement with the research performed by **Wamucii *et al*., (2020)** who reported that Sex and adopting self-care regimens in the management of Type II Diabetes are not significantly correlated.

Conclusion

According to the current study's findings, Patients with type II diabetes who attend an outpatient clinic have a significant incidence of mild cognitive impairment that is not yet identified. After implementation of the program, the elderly patient showed significant improvement in their knowledge score and practices. Concerning mental condition and quality of life of the studied older patients, they showed a significant improvement in these items.

Recommendations:

Increasing knowledge and practical skills of the diabetic old patient and their family caregivers' about type II diabetes and suspected complication such as Alzheimer disease should be a constant goal. Establishing and carrying out a program for health education will help achieve this, in hospitals, in out-patient clinics and to the public in the community.

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