Effect of Psycho-educational Program about Alzheimer's disease on Knowledge, Healthy Lifestyle, Depression, and Burden of Caregivers of Alzheimer's Patients

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Abstract: Alzheimer's disease (AD) has a major effect on Alzheimer's patients by limiting the ability to live independently. Family members providing persistent care to Alzheimer's patients suffer from extreme burden that alters their health, impairs their quality of life, and results in mental and physical exhaustion, which has a deteriorating effect on the care recipient.

The aim of the study: To evaluate the effect of psycho-educational program about Alzheimer's disease on knowledge, healthy lifestyle, depression, and burden of caregivers of Alzheimer's patients.

Subjects and Method: -Study design: Quasi experimental design (pre and posttest) study design was used to conduct this study.

Study settings: The study was conducted in Neuro and Psychiatric Outpatient Clinics of Tanta University Hospital, Health Insurance Hospital in Tanta city and Psychiatric Private Outpatient Clinics.

Study subjects: Convenient number of 45 caregivers of Alzheimer's patient who had attended the previous settings.

Tools of data collection: Four tools were used to collect the necessary data from the study subjects. Tool (I): Structured interview schedule. It consisted of two parts: - Part (1): Socio-demographic characteristics of the caregivers of Alzheimer's patient. Part (2): Bio- socio-demographic and clinical characteristics data of the cared Alzheimer's patient. Tool II: The Alzheimer's Disease Knowledge Scale (ADKS). Tool III: Health Promoting Lifestyle Profile II (HPLPII). Tool V I: - Beck Depression Inventory (BDI). Tool V: - The Zarit Burden Caregiver Scale.

Results: The result of this study revealed that there was an improvement of the mean of the total score of both Alzheimer's Disease Knowledge Scale (ADKS) and healthy lifestyle profile II dimensions and there was a reduction of the mean of the total score of both scales of Beck Depression Inventory (BDI) and Zarit Burden Caregiver.

Conclusion and recommendations: - It can be concluded that psycho-educational program was effective at reducing caregivers' burden and depression and improved the caregivers' level of knowledge and health promoting lifestyle profile of Alzheimer's patient. Therefore, the generalization of the psycho-educational program must be provided to caregivers of Alzheimer's patients to reduce their burden, depression, improve their healthy life style and strengthen the coping skill and thus improve their QOL.

Keywords: Alzheimer's patient, Caregiver burden, Depression, Health promoting.

1. INTRODUCTION

The most devastating mental health problem of the elderly is dementia and it is considered as one of the most compelling troubles of social and public health. Dementia usually results in an obvious decline in mental and physical skills of the affected elderly [1]. Worldwide, around twenty-five million of individuals have dementia and this number is expected to increase above 80 million by 2040. Alzheimer type is the most common type of cognitive deterioration observed during aging [2-4]..

Alzheimer disease (AD) is a degenerative, progressive and irreversible brain disease. It has an insidious onset and characterized by slow loss of cognitive and behavioral functions and affection disturbances. Among the other dementias, Alzheimer disease (AD) is the leading cause of disability by compromising the physical, mental and social integrity of the patients and has a major impact by limiting the patient's capacity to stay independently which needs increasingly regular and complex care [5,6]. The problem is not restricted only to patient loss of independence but also has repercussions on family members especially caregiver who provides direct care to patients [7]. Nearly all of Alzheimer patients resolve their personal needs and receive their daily car at home putting themselves between the hands of the caregiver. Thus, the significance of the caregiver is evident in the process of caring to person with Alzheimer [4, 6].

Caring for Alzheimer patients is a major life challenge for caregivers which includes emotional, physical and social burden. It also has been depicted as one of the most troublesome situations and is an extremely stressful challenge encountered by caregivers [8]. The alterations that take place in the life of caregivers such as constricting time, reduction of intimacy, and deterioration in social life, a sense of loss of autonomy over their own lives lead to caregiver burden [9]. Caregiver burden comprises the physical, mental, emotional, social and financial troubles experienced by the caregivers who care for persons with Alzheimer [10]. In fact, caregiver burden directly influences the quality of care for the Alzheimer patients and grant way to patient abuse both psychologically and physically and even disregard of the patient [11].

Alzheimer disease is called a family disease and family caregivers frequently called the invisible second patients [12]. Caregivers of Alzheimer patients can encounter different emotional troubles during the course of the illness. The psychological wellbeing of the family caregiver is adversely affected by caring. Higher levels of anxiety, stress, depression and other psychological problems are common among caregivers [13, 14].

A vigorous relationship between Alzheimer's caregiving and an adversely impact on the psychological wellbeing of the caregiver during the course of the illness has been demonstrated in numerous studies [15, 16]. Srivastava et al (2016) stated that due to the rigorous activity of caregiving, caregiver becomes more prone to develop psychiatric disorders. One such disorder that is regularly neglected and not treated is depression [2].

Family caregivers who had a significantly depressed mood may be negatively influenced in their capacity to perform desirable health maintenance behavior or self-care behavior in response to symptoms. So, understanding depression among caregivers of Alzheimer's patients is exceptionally imperative as the onset of depression is not only harmful to the caregivers but also may influence their continued ability to supply care for patients [11, 16]. In arrange to commit time to their cherished one, caregivers tend to victimization their claim recreation continuation and hobbies, diminish time with companions and family and provide up or decrease business. As a result of lack of social contact and upholding, caregivers often experience feelings of social bleakness [17,18]. So the evaluation and preservation of the psychological wellbeing of family caregivers of Alzheimer patients and attending their psychological needs must be taken in consideration as an asset to the proficient and moral fulfillment of this important role [19].

Caregivers of Alzheimer patients are at expended high risk of different health problems including lower insusceptibility, cardiovascular diseases, and poor sleep patterns, slower wound healing and higher levels of constant conditions such as diabetes, joints pain, ulcers, and anemia [18]. As a result of carrying out all of the household chores, sleep privation, extra cleaning, and laundry as well as moving or lifting their loved one the caregivers were exhausted. The caregivers who were in the worst health found moving and lifting their loved one a huge strain which affects their health and life style [20]. Compared with non-caregivers a more prominent number of physical health problems and more awful generally wellbeing was detailed by caregivers of Alzheimer patients [18].

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: www.noveltyjournals.com

In spite of the fact that the care of the caregiver is continuously considered very essential by keeping the balance of attention for both patient and caregiver, assessment of burden and conceivable psychological problems of caregivers is not routinely carried out by the health care professionals [21]. Misunderstanding and a lack of knowledge of the caregivers about the course of Alzheimer disease as well as beliefs around the moral duty of family members to supply care conceivably coming about unwilling or failure of caregiver to ask for assistance, withdrawal from wider solely to care for patient and driving caregivers into loneliness, downward spiral of isolation, and depression [14].

Nowadays, it is mandatory to advance interventions able to decline the marked impact that Alzheimer's patient has on his /her caregiver. Therefore, health care providers must offer numerous bolster and educational programs that help families in adapting with their caregiving responsibilities and roles whereas proceeding to have fruitful interactions and connections with their cherished ones [18]. To date, there is constrained evidence of effective interventions for diminishing burden and depression of care among family caregivers [14]. Among different sorts of interventions committed to bargain with caregiver burden and emotional troubles, psycho-education approaches are by distant the foremost examined one [6]. Psycho-educational interventions point at providing information about the disease and training caregivers to bargain with cognitive and behavioral symptoms of Alzheimer. [22]. Therefore, the aim of the current study was to evaluate the effect of psycho-educational program about Alzheimer's disease on knowledge, healthy lifestyle, depression, and burden of caregivers of Alzheimer's patients.

Operational definition:

Caregiver for the present study was operationally defined as the family member provides care to the Alzheimer patient on day to day basis most of the time. caregiver may be spouse, daughter, sons or other family member who was living with the patient in the same house and taking responsibility of activities of daily living (ADL).

The aim of the study:

The aim of this study was to evaluate the effect of psycho-educational program about Alzheimer's disease on knowledge, healthy lifestyle, depression, and burden of caregivers of Alzheimer's patients.

The research hypothesis:

Caregivers' knowledge about AD, their lifestyle, depression, and burden tend to improve after attending the psycho-educational counseling.

2. SUBJECTS AND METHOD

Study design:

Quasi experimental design (pre and posttest) study design were used to conduct this study.

Study settings:

The study was conducted in Neuro and Psychiatric Outpatient Clinics of Tanta University Hospital and Health Insurance Hospital in Tanta city and Psychiatric Private Outpatient Clinics.

Study subjects:

The convenient number of 45 caregivers of Alzheimer's patient who had attended the previous settings. Twenty of them from Neuro and Psychiatric Outpatient Clinic of Tanta University Hospital, fifteen from Neuro and Psychiatric Outpatient Clinic of Health Insurance Hospital in Tanta city, and teen from psychiatric private outpatient clinics.

Inclusion criteria:

-Age more than 20 and less than 55 years.

- Live in the same home with Alzheimer patients and accountable for imparting care to the Alzheimer patient on day to day basis.

-Agree to participate in the study.

Exclusion criteria:

-Having psychiatric illness, neurologic problems and chronic medical diseases.

-Having another family member with mental illness or chronic medical disease in the same home.

Tools of data collection:

Four tools were used to collect the data from the study subjects

Tool (I): Structured interview schedule:

It was developed by the researchers after reviewing the recent related literature review. It consisted of two parts: -

Part (1): Socio-demographic characteristics of the caregivers of Alzheimer's patient: - It consisted of data about socio-demographic characteristics of the study subjects. These data were age, residence, educational level, occupation, family income, marital status, number of children and their relative relationship to the elderly with Alzheimer's disease.

Part (2): **Bio- socio-demographic and clinical characteristics data of the cared Alzheimer's patient: -** This part aimed to assess the bio- socio-demographic characteristics of the cared patients ; age , sex , level of education ,marital status as well as questions to elicit the previous and past medical history of the cared Alzheimer's patient; duration of Alzheimer disease, accompanied medical disease such as DM, hypertension, kidney and heart diseases, AD family history and previous hospitalization.

Tool II: The Alzheimer's Disease Knowledge Scale (ADKS) [23, 24]

The Alzheimer's disease Knowledge Scale (ADKS) was designed by Carpenter et al., 2009. It aimed to assess the caregiver's knowledge about Alzheimer disease. It is Likert type scale requiring yes, no or doesn't know the answer. It contained 30 items which divided into seven domains. These domains included risk factors of AD, symptoms of AD, course of the disease, assessment and diagnosis of AD, treatment and management of AD, impact of AD on life, and care is given to AD patients.

Based on pilot study, the scale was modified by adding 12 items to become 42 items. These twelve items were added as follows: - two domains one about the definition of AD (3 items) and the other about stages of the AD (3items), one item for the risk factor, four items for symptoms, and one item for the domain of treatment and management of AD.

Scoring system of Alzheimer's disease Knowledge Scale (ADKS): -

The answer for each item was true (1) and false or don't know (0). A total composite score was calculated by adding together the scores for each item, total scores on the ADKS ranged from 0 to 42, with higher scores was indicating good knowledge. The total score of knowledge was categorized as follows: -

- Poor knowledge: < 50 % of the total score.

- Fair knowledge: 50 % - < 70 % of the total score.

- Good knowledge: ≥ 70% of the total score.

Tool III: Health promoting lifestyle profile II (HPLPII) [24—28]

This instrument was designed by Walker et al., 1987 based on Pender's health promotion model to measure health promoting lifestyle behaviors (HPBs). It contained fifty–two(52) items which in turn classified into six sub-scales which encompassed six healthy lifestyle dimensions:

- *The health responsibility dimension (9 items)*. It was about a person's attention and sensibility for his own health included items like "reporting any unusual signs or symptoms to a physician or other health professionals".

-*The physical activity dimension (8 items).* It was about the amount of exercise needed for a healthy life as "exercising vigorously for 20 or more minutes at least three times a week".

-*The nutrition dimension (9 items).* It was about a person's eating habits and meal choices as "choosing a diet low in fat, saturated fat, and cholesterol".

- *The interpersonal relation dimension (9 items).* It was the ability to communicate with and sustain one's close environment as "maintaining meaningful and fulfilling relationships with others".

-*The spiritual growth dimension (9 items)*: It was like finding each day interesting and challenging.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: www.noveltyjournals.com

- *Finally, the stress management dimension (8 items)* which about knew the factors that affect a person's stress level and their ability to control them as "taking some time for relaxation each day".

Scoring system of health promoting lifestyle profile II (HPLPII): -

- It uses a 4- point rating scale ranging from 1 (never), 2 (sometimes), 3 (often), and 4 (routinely), which was attached to each item.

- The overall score of the instrument ranged from 52 to 208, where each domain had its own separate score and higher scores indicated a better adherence to health promoting behaviors. The overall score was classified as the following:

➢ Scores 52-103 (25– < 50%): Low level of adherence to health promoting behaviors.

➢ Scores 104- 155 (50 % – < 75%): Moderate level of adherence to health promoting behaviors.

➢ Score above 156 (75% –100%): High level of adherence to health promoting behaviors.

Tool VI: - Beck Depression Inventory(BDI) ([29]: -

Beck Depression Inventory (BDI) was a questionnaire consisted of twenty-one questions that had been created to find and decipher the signs and symptoms of depression. Each item had possible four answers to select from. caregivers took BDI to pick one answer from the four alternatives rendered. Scores extend from zero, which point to the least degree of severity of symptoms, and a score of three, which describes the utmost severity.

Scoring system of Beck depression scale was as follows:

The total score of the scale ranges from 0 to 63 and classified as following: -

**Scores between 0- 9:- No indications of depression.

**Scores between 10 -16:- Mild level of depression.

**Scores between 17 - 29: - Moderate level of depression.

**Scores between 30 -63 severe level of depression.

Tool V: - The Zarit Burden caregiver scale [30, 31]

The Zarit Burden Interview (ZBI) was developed by Zarit et al., 1980 to measure subjective burden among caregivers of adults with dementia. Items have been created based on clinical experience with caregivers and prior studies resulting in a 22-item self-report inventory that examines burden related to functional/behavioral impairments and the domestic care circumstances. The items are worded subjectively, centering on the compelling reaction of the caregiver.

Scoring system of Zarit Burden caregiver scale was as follows:

- Each question is scored on a 5-point Likert scale ranging from (0) never to (4) nearly always present. Possible responses :0, never; 1, rarely; 2, sometimes;3, quite frequently; and 4, nearly always. Total scores range from 0 (low burden) to 88 (high burden). Score values and interpretation were guidelines as follows: -

➢ No or minimal burden 0 to 20.

➢ Mild to moderate burden 21 to 40

➢ Moderate to severe burden 41 to 60

➢ Sever burden 61 to 88.

3. METHOD

1. An official permission to carry out the study was obtained from Dean of the Faculty of Nursing to the manager of Outpatients Clinics of Tanta University, Health Insurance Hospital in Tanta city and Private Clinic.

2. Ethical considerations:

- An informed consent of the studied subjects was obtained after appropriate explanation of the nature and purpose of the study.

- Anonymity and confidentiality of the collected data and the right to withdraw from the study at any time was assured.

- Nature of the study was not cause harm and/or pain to the entire sample.

3. Developing tools: Tool I was developed by the researchers based on reviewing of recent related literature. Tool II, III, and IV were translated into the Arabic language by the researchers and organized by the researchers before data collection. All tools of data collection were tested for their face and content validity by five experts in the related fields and the necessary modifications were done.

4. The reliability of the tools was tested by using the Cronbach's alpha for the Arabic version of four tools which was 0.855 for the Alzheimer's Disease Knowledge Scale (ADKS), 0.955 for Health Promoting Lifestyle Profile II (HPLPII), 0.753 for Beck Depression Inventory (BDI) and 0.974 for the Zarit Burden Caregiver Scale

5. A pilot study was carried out on a sample of five caregivers of Alzheimer's patient to ascertain the clarity and applicability of the study tools. It also severed to estimate the approximate time required for the studied subject as well as to identify any obstacles that might be faced during data collection and these subjects were excluded later from the study and necessary modifications on tool II were done as mentioned before.

6. The actual study:

- The actual study was conducted in four phases:

I. Phase one: - Assessment phase:-(pretest)

-The data was collected by the previously mentioned tools through interviewing each studied subject individually in predetermined setting to collect the baseline data as a pre-intervention assessment. The interview period ranged from 45-60 minutes.

II. Phase two: Psycho-educational program development.

-A psycho-educational program was developed based on the results of phase one that determines the studied subjects' needs and recent relevant literature review.

III. Phase three: Psycho-educational program implementation.

The psycho-educational program content was implemented on 9 sessions in which caregivers attended 2 sessions per week for 4weeks.

• The psycho-educational program sessions were carried out with the duration of each session approximately 30- 40 minutes.

The psycho-educational program was conducted by using individual counselling for each caregiver, questions answering and skill training. Teaching materials were included power point presentation, videos, posters, demonstration for relaxation techniques and physical exercises, and role play. The handout was distributed on the caregivers. It was written in a simple Arabic language and supplemented by photos and illustrations to help the studied caregivers in the understanding of the content simply.

Session (1): Orientation about the program.

The aim of this session was to orient the studied caregivers about the purpose of the counselling and its schedule and then conducting the pretest to collect the baseline data as a pre-intervention assessment *(pretest)*.

Session (2): Provision knowledge about the AD.

The aim of this session was to help caregivers to define Alzheimer's disease, enumerate risk factors of AD and recall common symptoms of the AD.

Session (3): Provision knowledge about consequences and management of AD.

This session was aimed to help the studied caregivers to identify consequences and impact of AD, explain prognosis of AD and remember basic management of AD.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: www.noveltyjournals.com

Session (4): Provision knowledge about physical exercise.

This session was aimed to help the studied caregivers to demonstrate physical exercise and list common and suitable physical exercise in order to reduce depression, burden, and improve their lifestyle.

Session (5): About healthy diet and types of healthy food.

This session was aimed to enable the studied caregivers to follow healthy diet in daily life and classify types of healthy food.

Session (6 – 7): Dealing with behavioral and emotional changes of the patients.

The sessions were aimed to enable the studied caregivers to deal with behavioral and emotional change of the patient such as anger, depression, and loss of the memory, wander, and communications problems. This was done through video, role play and demonstrations of some relaxation techniques.

Session (8-9): Acquiring skills of stress management and coping with caregiver's role.

This session was aimed to train studied caregivers to cope with the stress of caregiver role. The researchers taught the studied caregivers some of the stress management techniques such as time management, problem solving skills, decision-making guidance and meditation and demonstrations of some relaxation techniques.

IV. Phase four: Psycho-educational program evaluation.

The aim of this phase was to determine the effectiveness of the psycho- educational intervention. This was done by re-applying the tools (II, III, IV, and V) through interviewing the subjects twice: -

-First time: Before implementation of the intervention (pretest).

-Second time: Two months after the implementation of the intervention.

7. The actual data collection was started from May to December 2017. The researchers met the study subjects in the waiting areas of the previously mentioned settings two days per week.

8. Through 2 months after psycho-educational program implementation, the researchers follow up the caregivers by calling or conducting the home visit in order to do posttest evaluation.

9. Statistical analysis

Using SPSS (version 20) for coding, entering and analyzing data. The range, mean, and standard deviation were calculated for quantitative data. Comparison was done using chi-square for qualitative data. For comparison between means of two parametric variables student t-test was used. Spearman's correlation coefficient was used for evaluation between variables of the study. A significant was adopted at P value < 0.05 for interpretation of results of significance. High significance was adopted at P value < 0.01.

4. RESULTS

Table (1): Distribution of The Studied Caregivers According to Their Socio-demographic Characteristics

Variables	The studied caregivers (45)	
	N	%
Age	6	13.33
- 20-30	9	20
- 31-40	24	53.33
- 41-50	6	13.33
- 51-55		
Range	**20 – 55**	
Mean ± SD	**41±8.90**	
Residence	15	33.33
- Urban	30	66.67

- Rural		
Gender		
- Male-	9	20
- Female	36	80
Marital stats	3	6.67
- Single	36	80
- Married	3	6.67
- Divorced	3	6.67
- Widowed		
Education level	9	20
- Read and write	15	33.33
- Secondary / Technical education		
- University education	21	46.66
Occupation	21	46.67
- Work	24	53.33
- Not work		
Income	42	93.33
- Enough	3	6.67
- Not enough		
Number of children		6.67
- One	3	26.67
- Two	12	66.66
- Three and more	30	
Kinship with Alzheimer 's patient	6	13.33
- Son	22	48.88
- Daughter	3	6.67
- Brother	**14**	**31.11**
- **Others**		
- Daughter-in-law	10	22.22
- Sister's daughter	4	8.88

Table (1): represents the distribution of the studied caregivers according to their socio-demographic characteristics. The table showed that the age of the studied caregivers ranged from 29-60 year with Mean ± SD (41±8.90) year and more than half (53.33%) of them their age from 40-50 year. The table also revealed that about two-thirds (66.67%) of them from the rural area. The majority (80 %) of the studied caregivers were female and married. Nearly half (46.66% &46.67% respectively) of them were university education and worked. Most of them (93.33%) had enough income. Regards kinship of caregivers with Alzheimer's patient nearly half (48.88%) of them were their daughters.

Table (2): Distribution of The Studied Alzheimer's Patients According to Their Bio-socio-demographic Characteristics

Variables	The studied Alzheimer's patients (45)	
	n	**%**
Age	**6**	**13.33**
- 65-70	**15**	**33.33**
- 70-75	**15**	**33.33**
- 75-80	**9**	**20**
- 80-90		
Range	**65-90**	
Mean ± SD	**74.73±6.30**	

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: www.noveltyjournals.com

Residence		
- Urban	15	33.33
- Rural	30	66.67
Gender		
- Male	21	46.67
- Female	24	53.33
Marital status		
- Single	6	13.33
- Married	18	40
- Separated	3	6.67
- Widowed	18	40
Education level		
- Illiterate	24	53.33
- Reads and writes	6	13.33
- Basic education	9	20
- Secondary / Technical Secondary education	3	6.67
- University education	3	6.67
Occupation		
- Not work	45	100
Duration of Alzheimer 's disease		
- One year	18	40
- Three years	6	13.33
- Four years	3	6.67
- Five years and more	18	40
# Chronic diseases suffered by the patient		
- Hypertension	42	93.33
- Heart disease	12	26.67
- Kidney disease	3	6.67
- Diabetes	9	20
- Osteoporosis	15	33.33
- Arthritis	33	73.33
- Asthma (chest sensitivity)	3	6.67
- Obesity	15	33.33
Family history of Alzheimer's disease.		
- Yes	15	33.33
- No	30	66.67
Pervious hospitalization		
- Yes	18	40
- No	27	60
Another person is helping caregivers in caring for Alzheimer's patient.		
- Yes		
- No	24	53.33
	21	46.67
# If yes, type of help		
- Financial	6	22.22
- Morality	3	11.11
- Physical	18	66.67

 (# More than one choice allows)

Table (2): shows distribution of the studied Alzheimer's patients according to their bio-socio-demographic characteristics. The table showed that the age of Alzheimer's patients ranged from 65-90 years with Mean ± SD (74.73±6.30) and about two- thirds (66.67%) of them from the rural area. More than half (53.33 %) of Alzheimer's patients were female and illiterate and more than one- third (40%) of them were married, widowed and duration of

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: **www.noveltyjournals.com**

Alzheimer's disease was one year. Regarding chronic diseases, the table showed that the majority (93.33 % & 73.33 % respectively) of Alzheimer's patients were suffering from hypertension and arthritis while about one third (33.33%) of them had osteoporosis and obesity. The table also revealed that about one third (33.33%) of them had the family history with Alzheimer's disease. More than half of Alzheimer's patients had help from another person either than family caregivers more than two-thirds of this help was physical.

Table (3): Distribution of The Studied Caregivers According to Their Total Means Score of The Alzheimer's Disease Knowledge Scale (ADKS) and Its Domains and Their Extent of Change pre and post Psycho-educational Program Implementation

Variables		Mean	±	SD	Difference		% of change	Paired T-test	
					Mean	SD		T	P-value
Definition of Alzheimer	Pre	1.333	±	0.798	-0.600	1.156	45.000	-3.482	0.001*
	Post	1.933	±	0.863					
Risk factors for AD	Pre	3.667	±	1.834	-1.933	2.406	52.727	-5.389	0.000*
	Post	5.600	±	0.889					
Symptoms of AD	Pre	6.133	±	0.968	-1.000	0.977	16.304	-6.866	0.000*
	Post	7.133	±	0.625					
Course of the disease	Pre	1.200	±	1.342	-1.533	1.561	12.778	-6.590	0.000*
	Post	2.733	±	0.688					
Stags of AD	Pre	2.267	±	0.447	-0.533	0.894	23.529	-4.000	0.000*
	Post	2.800	±	0.661					
Assessment and diagnosis	Pre	2.067	±	0.863	-0.467	1.517	22.581	-2.064	0.045
	Post	2.533	±	0.894					
Treatment and management of AD	Pre	2.933	±	0.780	-0.467	0.894	15.909	-3.500	0.001*
	Post	3.400	±	0.618					
Impact of AD on life	Pre	2.200	±	0.757	0.200	1.290	9.091	1.040	0.304
	Post	2.000	±	0.905					
Care is given to AD patients	Pre	1.867	±	1.100	-0.400	1.321	21.429	-2.031	0.048
	Post	2.267	±	0.688					
Total score of ADKS	Pre	**23.667**	±	**4.710**	**-6.733**	**5.319**	**28.451**	**-8.492**	**0.000***
	Post	**30.400**	±	**2.973**					

* Significant at P <0.001.

Table (3): represents distribution of the studied caregivers according to their total means score of The Alzheimer's Disease Knowledge Scale (ADKS) and its domains and their extent of change pre and post psycho-educational program implementation. The table showed that there was statistically significant difference between pre and post program in relation to domains of definition, risk factors , symptoms, course, stags ,and treatment and management of Alzheimer's Disease (P <0.001) but there was no statistically significant difference between pre and post psycho-educational program in relation to domains of assessment and diagnosis, impact of AD on life and care given to AD patients (P = 0.045, 0.304, & 0.048 respectively).The table also revealed that the mean of total score of ADKS was increased from 23.667± 4.710 pre psycho-educational counselling to be 30.400±2.973 post- psycho-educational program and there was a statistically significant difference between pre and post- psycho-educational program in relation to the total score of ADKS(P <0.001) .

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: www.noveltyjournals.com

Table (4): Distribution of the Studied Caregivers According to Their Total Means Score of Health Promoting Lifestyle Profile II and Its Dimensions and Their Extent of Change pre and post Psycho-educational Program Implementation

Variables		Mean	±	SD	Difference Mean	Difference SD	% of change	Paired T-test T	Paired T-test P-value
The health responsibility dimension	Pre	21.067	±	4.707	-3.200	6.525	15.190	-3.290	0.002*
	Post	24.267	±	3.313					
The physical activity dimension	Pre	12.467	±	3.690	-3.467	5.115	27.807	-4.546	0.000*
	Post	15.933	±	4.392					
The nutrition dimension	Pre	18.200	±	4.214	-2.467	5.488	13.553	-3.015	0.004*
	Post	20.667	±	2.111					
The interpersonal relation dimension	Pre	20.933	±	4.933	-2.667	4.651	12.739	-3.846	0.000*
	Post	23.600	±	2.606					
The spiritual growth dimension	Pre	14.600	±	3.798	-2.467	4.475	16.895	-3.697	0.001*
	Post	17.067	±	2.290					
The stress management dimension	Pre	21.733	±	6.631	-5.467	4.966	25.153	-7.384	0.000*
	Post	27.200	±	4.165					
Total score health promoting lifestyle profile II dimensions	**Pre**	**109.000**	**±**	**21.545**	**-5.467**	**4.966**	**25.153**	**-7.384**	**0.000***
	Post	**128.733**	**±**	**11.191**					

* Significant at P <0.001.

Table (4): shows the distribution of the studied caregivers according to their total means score of health promoting lifestyle profile II and its dimensions and their extent of change pre and post- psycho-educational program implementation. The table revealed that there was a statistically significant difference between pre and post psycho-educational program in relation to all dimensions of health promoting lifestyle profile II (P <0.001). The table also showed that the mean of the total score of health promoting lifestyle profile II dimensions was increased from 109.000± 21.545 pre-psycho-educational program to be 128.733±11.191 post- psycho-educational counselling and there was a statistically significant difference between total score of health promoting lifestyle profile II pre and post - psycho-educational program (P <0.001).

Table (5): Distribution of The Studied Caregivers Regarding Their Total Means Score of Beck Depression Inventory and Their extent of Change pre and post Psycho-educational Program Implementation

Variables		Mean	±	SD	Difference Mean	Difference SD	% of change	Paired T-test T	Paired T-test P-value
Depression	Pre	30.521	±	10.324	9.24	9.437	30.275	5.63	0.012*
	Post	21.281	±	6.213					

Table (5): shows the distribution of the studied caregivers regarding their total means score of depression and their extent of change pre and post psycho-educational program implementation. The table showed that mean ± SD of depression of the studied subjects was decreased from 30.521 ± 10.324 pre- psycho-educational counselling to 21.281 ± 6.213 post- psycho-educational counselling and there was a statistically significant difference between depression of the studied subjects pre and post- psycho-educational program (p<0.012)

Table (6): Distribution of the Studied Caregivers According to Their Total Means Score of Burden and Their Extent of Change pre and post Psycho-educational Program Implementation

Variables		Mean	±	SD	Difference Mean	Difference SD	% of change	Paired T-test t	Paired T-test P-value
The Zarit Burden Caregiver Scale	Pre	65.133	±	15.288	13.867	21.462	21.290	4.334	0.000*
	Post	51.267	±	15.178					

* Significant at P <0.001.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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Table (6): represents distribution of the studied caregivers according to their total means score of burden and their extent of change pre and post psycho-educational program implementation. The table revealed that mean ± SD of the level of Zarit Burden caregiver scale of the studied subjects was decreased from 65.133±15.288 pre-program to be 51.267±15.178 post psycho-educational counselling and there was statistically significant difference between the level of Zarit Burden caregiver scale of the studied subjects pre and post psycho-educational program (p<0.000).

Table (7): Distribution of The Studied Caregivers According to Their Level of The Alzheimer's Disease Knowledge Scale (ADKS), Health Promoting Lifestyle Profile II, Depression and the Zarit Burden Caregiver Scale

Variables		Pre		POST		Chi-square	
		N	%	N	%	X^2	P-value
Level of the Alzheimer's Disease Knowledge Scale (ADKS)	Poor	15	33.3	0	0.0	63.126	<0.001*
	Fair	27	60.0	9	20.0		
	Good	3	6.7	36	80.0		
Level of health promoting lifestyle profile II	Low	21	46.7	0	0.0	35.606	<0.001*
	High	24	53.3	45	100.0		
Level of Beck Depression Inventory	No depression	12	26.7	21	46.7	15.840	<0.001*
	Mild	15	33.3	18	40.0		
	Moderate	9	20.0	6	13.3		
	Severe	9	20.0	0	0.0		
Level of the Zarit Burden Caregiver Scale	Mild	6	13.3	9	20.0	22.360	<0.001*
	Moderate	6	13.3	24	53.3		
	Severe	33	73.3	12	26.7		

* Significant at P <0.001.

Table (7): represents the distribution of the studied caregivers according to their level of the Alzheimer's Disease Knowledge Scale (ADKS), Health Promoting Lifestyle Profile II, Depression and the Zarit Burden Caregiver Scale. The table revealed that (33.3%,46.7% ,20.0% and73.3% respectively) of the studied caregivers had a poor level of ADKS, low level of health promoting lifestyle profile II ,severe level of depression and severe level of the Zarit burden caregiver scale pre psycho-educational counselling compared to (80.0%, 100.0%,46.7% and 20% respectively) of them had a good level of ADKS, high level of health promoting lifestyle profile II, no depression and mild level of the Zarit burden caregiver scale post psycho-educational program. The table also showed that there was a statistically significant difference in the level of the Alzheimer's Disease Knowledge Scale (ADKS), Health Promoting Lifestyle Profile II, Depression and the Zarit Burden Caregiver Scale per and post psycho-educational program (p<0.001).

Table (8): Correlation Between Level of The Alzheimer's Disease Knowledge Scale (ADKS), Health Promoting Lifestyle Profile II, Depression and the Zarit Burden caregiver scale

Variables		The Alzheimer's Disease Knowledge Scale	Health promoting lifestyle profile	Depression
Health promoting lifestyle profile II	R	0.394		
	P-value	0.042*		
Depression	R	-0.514	-0.767	
	P-value	0.006*	0.000*	
The Zarit Burden Caregiver Scale	R	-0.160	-0.372	0.716
	P-value	0.427	0.056	0.000*

Significant at P <0.001

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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Table (8): shows the correlation between the level of the Alzheimer's disease Knowledge Scale (ADKS), health promoting lifestyle profile II, depression and the Zarit Burden caregiver scale. The table showed that there was statistically significant positive correlation between the level of the Alzheimer's Disease Knowledge Scale (ADKS) and Health Promoting Lifestyle Profile II (P < 0. 042*) also between the level of depression and the level of the Zarit Burden Caregiver Scale (P < 0. 000*). But there was a statistically significant negative correlation between depression and the level of the Alzheimer's Disease Knowledge Scale (ADKS) and Health Promoting Lifestyle Profile II (P < 0.006 and P < 0.000).

5. DISCUSSION

With the growing older of the population, an expanding number of individuals have Alzheimer and most of whom are getting domestic care. As a result caregivers of Alzheimer's patients are exposed to high risk of a variety of stressors which may lead to feeling burdened, depression and anxiety [32]. Because of the burden of caregiving in AD can lead to both physical and psychological problems in caregivers, it is imperative to ensure that caregiver's well-being is kept up as the patient's illness advances [33, 34]. The present study aimed to evaluate the effect of psycho-educational program about Alzheimer's disease on knowledge, depression, promoting healthy lifestyle and burden on caregivers of Alzheimer's patients.

Data emerging from the current study indicated that about three-quarters of studied caregivers of Alzheimer's patients had a moderate and severe depression and most of them experienced burden and about half of studied caregivers had a low level of the health promoting style. Psycho-educational program was effective at reducing Alzheimer's caregivers' burden and improve their level of knowledge, burden, depression and health promoting lifestyle profile. Additionally, there was a statistically significant positive correlation between the burden and the caregivers' depression and statistically significant negative correlation between burden, the depression and health promoting lifestyle profile were found in the present study.

In relation to the result of most the studied caregivers experienced burden, matching with this result, Allegri **et al., (2006)** stated that the burden endured by caregivers of Alzheimer patients seemed to be higher than that observed when giving care for patients with physical health problems [1]. In this respect, **Brodaty & Donkin (2009)** mentioned that caregivers confront with numerous obstacles as they adjust caregiving with other requested and needs, counting child rearing, career, and relationships and they are at expanded hazard for burden [12]. During collecting data of the present study most of the caregivers reported that they had to alter their daily life activities to meet the needs of cared patients and fulfill their caregiving roles. In this respect, **Medrano et al., (2014)** stated that alterations that take place in the life of caregivers, such as constricting of time, diminishment of intimacy, disintegration in social life, a sense of misfortune of control over their lives, may cause physical, social and psychological burden [5].

It is well archived that family caregivers Alzheimer's patients have predominant more depressive symptoms than age and gender-matched non-caregivers and prevalence rates for depression among caregivers Alzheimer's patients are detailed to run from 28% to 55% [13]. This result is harmony with the result of the present study which about three-quarter of subjects suffered from depressive symptoms. Consistency with the result of the current study, other studies have found that caregivers of Alzheimer patients are at chance of depression with prevalence rates of self-reported depression among community-dwelling caregivers revealed to be as high as 83% [35, 36]. This may be related to the nature of Alzheimer disease itself, with disease progression; cognitive and functional deterioration of Alzheimer patients will cause further loss of autonomy and expanded reliance on caregiver to perform essential activities of the daily living. Beside patient's dependency, caregiver has not knowledge or skills to deal with patient. As a result of that, caregivers have not only to devote more time caring for the patient, but also perform this activity under more stress and depression.

Alzheimer's caregivers are at an expanded hazard of different health problems counting cardiovascular diseases, lower insusceptibility, poorer immune reaction to vaccine, slower wound healing, higher levels of chronic conditions (such as diabetes, joints pain, ulcers, and anemia), more specialist visits and utilize of prescribed medications, poorer self-rated health, diminished engagement in preventative wellbeing behaviors such as exercise, and more noteworthy probability of smoking, drinking alcohol, and poor sleep patterns. [37]. In the same direction, the results of the current study were estimated that about half of the subjects of the present study had a low level of health promoting style. Results of many studies supported the result of the current study in which they were estimated that about half of increment within the

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: www.noveltyjournals.com

request for healthcare services for caregivers 'of Alzheimer patients and up to 60% of them may create physical and/or mental problems such as hypertension, sleep disorders, digestive problems, immunologic system deficiency, respiratory diseases, insomnia, anxiety and depression [6, 38, 39].

Alzheimer is a progressive degenerative neurological disease with no known cure. The day-to-day responsibility of caring for a person with Alzheimer represents considerable psychological, physical, social and financial burdens on careers. To protect caregivers from getting overburdened, variety of supportive interventions, such as psycho-education, respite care, cognitive behavioral interventions, and occupational therapy have been created to move forward their well-being. [9]. In the present study, the researchers found that psycho-educational counselling was effective at reducing caregiver's burden and improved the caregivers' level of knowledge, depression and health promoting lifestyle profile of Alzheimer's caregiver. This result may be due to psycho-educational program as intervention for caregivers have included the provision of information about AD (definition, causes, stages, prognosis, and its treatments), care planning, advice about patient management and the importance of self-care. Meanwhile, in the training sessions, caregivers can learn how to manage challenging behaviors of patients, improve communication skills, and keep the person with Alzheimer's safe, how to manage stress and problem-solving and decision-making guidance. In the actual data collection of present study, subjects complain from their inadequacy of information about Alzheimer disease course and skills of caring of their patients and this conceivably coming about in an unwillingness or lack of ability to ask for assistance and withdrawal from caring for a relative and experienced more physical and psychological burden . Another explanation for the effect of psych educational program may be due to education regarding Alzheimer may increase caregiver's feelings of autonomy and competency and this may be more likely to have diminished the desires of their dependents capacities. From the researchers' point of view these results were also due to the relaxation techniques used by the researchers to relieve stress, the caregivers' ventilation with the researchers, and just because the caregivers found someone to listen to them.

This result is consistent with study carried by **Santos et al., (2013**), their study aimed to assess the relation between the participation in a psycho-educational group and the reduce of Alzheimer caregivers' burden, depressive and anxious symptoms, and the study found that psycho-educational interventions have been validated to minimize caregiver burden and depression and delay nursing home admission [10]. Similar studies indicated that psycho-educational interventions have been effective at expanding caregiver information, improving mood, decreasing stress and depression levels, and delaying nursing home placement [40]. Similarity, **Brodaty & Donkin (2009)** referred to that strategies, for example education that designed to ease caregiver trouble has demonstrated their effectiveness on the syndromes features. When caregivers have been informed of the disease's features and prognosis, their burden levels and depression symptoms decreased compared with those who had not been informed [12].

The result of the current study revealed that there was a statistically significant positive correlation between the burden and the caregivers' depression and statistically significant negative correlation between burden, the caregivers' depression and health promoting lifestyle profile. In this respect, **Beinart et al., (2012**) found that there was an affiliation between depression and decreased physical well-being, such as disrupted sleep patterns, increased incidence of cardiovascular and metabolic diseases, lowered immunity and early transition to frailty syndrome among caregivers' of Alzheimer patients [14]. In another study, the caregivers' poor perceived health was associated with emotional exhaustion, depression, anxiety, and increased levels of burden [35]. **Farina et al., (2017**) reported that depression and other mental health effects such as higher levels of stress and anxiety were common among family members who care for Alzheimer patients and psychological health of the family caregiver was adversely affected with providing care [7]. Many studies had shown that the incidence of depression in caregivers was high, ranging from 18 to 47 percent, and caregivers who were depressed experience higher degrees of burden [34, 42]. In addition, **Iavarone et al., 2014** found that greater levels of burden may correlate with accelerated morbidity and mortality in caregivers [9].

6. CONCLUSION

Based on the findings of the current study, it can be concluded that the psycho-educational program was effective at reducing caregiver burden and improved the caregivers' level of knowledge, burden, depression and health promoting lifestyle profile of Alzheimer's patient. Furthermore, the present study revealed that there was a statistically significant positive correlation between depression and burden of caregivers and between their level of knowledge and health promoting lifestyle profile and there was a statistically significant negative correlation between caregivers' level of knowledge, depression and burden from Alzheimer's patient.

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 5, Issue 2, pp: (266-282), Month: May - August 2018, Available at: **www.noveltyjournals.com**

7. RECOMMENDATIONS

Based on findings of the current study, it was recommended that:

1- Generalization of psycho-educational counselling must be introduced to the caregivers of Alzheimer's patients to decrease their burden, depression, improve their healthy life style, powering the coping skills and thus improve their QOL.

2- Caregivers of Alzheimer's patients should be trained by healthcare resources for the Alzheimer's patients on coping strategies for providing psychological counselling for caregivers and community-based services.

3- Support mechanisms such as relief care, home care, day hospitals, as well as psychological and recreational support programs which created by social and health policies should be offered for families who have family members with Alzheimer's patient.

REFERENCES

[1] Allegri R, Sarasola D, Serrano C, Taragano F, Arizaga R, Butman J & Lon l. Neuropsychiatric symptoms as a predictor of caregiver burden in Alzheimer's disease. Neuropsychiatric Disease and treatment, 2006; 2(1): 105–110.

[2] Srivastava G, Tripathi R, Tiwari S, Singh B & Tripathi S. Caregiver Burden and Quality of Life of Key Caregivers of Patients with Dementia. Indian J Psychol Med, 2016; 38(2):133-136.

[3] Ferrara M, Langiano E, Brango T & Elisabetta T. Prevalence of stress, anxiety and depression in with Alzheimer caregivers. Health Quality Life Outcomes, 2008; 6: 93. 1-5.

[4] Bevans F & Sternberg M. Caregiving Burden, Stress, and Health Effects among Family Caregivers of Adult Cancer Patients. JAMA, 2012; 307(4): 398–403.

[5] Medrano M, López R, Anyolina R, Payano N & Reynoso N. Burden, anxiety and depression in caregivers of Alzheimer patients in the Dominican Republic Dementia. Neuropsychology, 2014; 8(4): 384–388.

[6] Kamkhagi D, Costa A, Kusminsky S, Supino D, Diniz B, Gattaz W & Forlenza O. Benefits of psychodynamic group therapy on depression, burden and quality of life of family caregivers to Alzheimer's disease patients. Arch. Clin. Psychiatry,2015; 42(6).157-160.

[7] Farina N, Daley S, Brown A, Bowling A & Basset T. Factors Associated with the Quality of Life of Family Carers of People with Dementia: A systematic review. Alzheimer's Dement, 2017; 13(5):572-581.

[8] Rosness T, Mjørud M & Engedal K. Quality of life and depression in carers of patients with early onset dementia. Aging Mental Health, 2011; 15(3):299-306.

[9] Iavarone A, Ziello A, Pastore F, Fasanaro A & Poderico C. Caregiver burden and coping strategies in caregivers of patients with Alzheimer's disease. Neuropsychiatric Treatment, 2014; 10: 1407–1413.

[10] Santos R, Sousa M, Arcoverde C& Dourado M. Efficacy of a psycho-educational group with caregivers of patients with dementia. Archives of Clinical Psychiatry, 2013; 40(4).162-164.

[11] Fauth E, Hess K, Piercy K, Norton M, Corcoran C, Rabins P, Lyketsos C & Tschanz J. Caregivers' relationship closeness with the person with dementia predicts both positive and negative outcomes for caregivers' physical health and psychological well-being. Aging & Mental Health, 2012; 16: 699–711.

[12] Brodaty H & Donkin M. Family caregivers of people with dementia. Dialogues Clinical Neuro sciences. 2009; 11(2): 217–228.

[13] Liu S, Li C, Shi Z, Wang X, Zhou Y, Liu S, Liu J, Yu T & Ji Y. Caregiver Burden and Prevalence of Depression, Anxiety and Sleep Disturbances in Alzheimer's disease Caregivers in China. Journal of Clinical Nursing, 2017; 26(9-10):1291-1300

[14] Beinart N, Weinman J, Wade D, & Brady R. Caregiver Burden and Psych educational Interventions in Alzheimer's disease: A Review. Dementia Geriatric Cognitive Disorder, 2012; 2(1): 638–648.

[15] Bass D, Judge K & Snow A. Negative Caregiving Effects among Caregivers of Veterans with Dementia. American Journal of Geriatric Psychiatry, 2012; 20(3):239–247.

[16] Springate, A & Tremont G. Dimensions of Caregiver Burden in Dementia: Impact of Demographic, Mood, and Care Recipient Variables. Am J Geriatric Psychiatry, 2014; 22(3): 294–300.

[17] Schulz R & Sherwood P. Physical and Mental Health Effects of Family Caregiving. Am J Nurs, 2008; 108(9 Suppl): 23–27.

[18] The "Invisible Second Patients:" How Alzheimer's Effects the Entire Family. 2016. available at http://www. northwoodsmemorycare.com/invisible-secondpatients-alzheimers-disease/

[19] Sophie V, Nele V, Koen P, Sofie V, Kristof F& Lieven A. Effectiveness of Supporting Informal Caregivers of People with Dementia: A Systematic Review of Randomized and Non-Randomized Controlled Trials . Journal of Alzheimer's disease, 2106; 52(3):929-965.

[20] Boots L. Qualitative study on needs and wishes of early-stage dementia caregivers: the paradox between needing and accepting help. Int Psychogeriatric, 2015; 8:1-10

[21] Essam H. Psycho-educational program for Alzheimer's disease Caregivers: A grant proposal. California State University, Long Beach, ProQuest Dissertations Publishing, 2015.

[22] De Silva M, Cooper S, Li H, Lund C& Patel V. Effect of Psychosocial Interventions on Social Functioning in Depression and Schizophrenia: Meta-Analysis. The British Journal of Psychiatry, 2013; 202 (4):253-260.

[23] Carpenter B, Balsis S, Otilinga P, Hanson P & Gatz M. The Alzheimer's disease Knowledge Scale: Development psychometric properties. The Gerontologist, 2009; 49: 236–247.

[24] Dieckmann L, Zarit S, Zarit J& Gatz M: The Alzheimer's disease Knowledge Test. Gerontologist, 1988, 28(3):402–407.

[25] Walker N, Sechrist R & PenderJ. The Health-Promoting Lifestyle Profile: Development and psychometric characteristics. Nursing research, 1987; 36(2): 76-81.

[26] Pender N, Murdaugh J & Parsons A. The health promotion model manual. Health Promotion in Nursing Practice, 2011: 1-17.

[27] Callaghan M. The development of a faith community nursing intervention to promote health across the life span. International Journal of Faith Community Nursing, 2015; 1(2): 8-20.

[28] Johnson E, Gulanick M, Aprn F, Penckofe S & Kouba J. Does knowledge of coronary artery calcium affect cardiovascular risk perception, likelihood of taking action, and health-promoting behavior change? J Cardiovasc Nurs, 2015; 30(1): 15-25.

[29] Beck A, Ward C, Mendelson M, Mock J & Erbaugh J. An inventory for measuring depression. Journal of Archives of General Psychiatry, 1961; 4: 561-571.

[30] Zarit S, Reever K & Bach-Peterson J. Relatives of the Impaired Elderly: Correlates of Feelings of Burden. The Gerontologist, 1980, 20(6); 649-655.

[31] Herbert R, Bravo G & Preville M. Reliability, validity, and References Values of the Zarit Burden Inerview for Assessing Informal Caregivers of Community Dwelling Older Persons with Dementia. Canadian Journal on Aging, 2000; 19(1): 464- 507.

[32] Vandepitte, Sophiea, Van Den Noortgate, Koenc Verhaeghe, Sofiea Faes & Kristofa. Effectiveness of Supporting Informal Caregivers of People with Dementia: A Systematic Review of Randomized and Non-Randomized Controlled Trials. Journal of Alzheimer's disease, 2016; 52, (30): 929-965.

[33] Hayslip B & GiBaeg H. Anderson C. Predictors of Alzheimer's disease caregiver depression and burden: what non-care-giving adults can learn from active caregivers? Educ Gerontol. 2008; 34:945–969.

[34] Garcia-Alberca J, Lara J & Berthier M. Anxiety and depression in caregivers are associated with patient and caregiver characteristics are associated with coping strategies in caregivers of Alzheimer's disease patients in Alzheimer's disease. International Journal of Psychiatry Med, 2012; 41:57–69.

[35] Aggar C, Ronaldson S & Cameron I. Reactions to caregiving of frail, older persons predict depression. International Journal of Mental Health Nursing, 2010; 19:409–415.

[36] Mohamed S, Rosenheck R, Lyketsos C & Schneider L. Caregiver burden in Alzheimer disease: cross-sectional and longitudinal patient correlates. American Journal of Geriatric Psychiatry, 2010; 18:917–927.

[37] Soilemezi D, Drahota A, Crossland J, Stores R & Costall A. Exploring the meaning of home for family caregivers of people with dementia. International Journal of Environmental Psychology, 2017; 51: 70-81.

[38] Gaugler J, Mittelman M, Hepburn K & Newcomer R. Predictors of change in caregiver burden and depressive symptoms following nursing home admission. Psychology Aging, 2009; 24(2):385-96.

[39] Ryan K, Weldon A, Huby N, Persad C, Bhaumik A & Heidebrink J. Caregiver support service needs for patients with mild cognitive impairment and Alzheimer disease. Alzheimer Disease Association Disorder, 2010; 24(2):171-6.

[40] Despina L, Middlemass J, Terence K & John H. *Psycho*-educational interventions for informal caregivers of people with dementia: a systematic review. (2015).

[41] Li R, Cooper C, Bradley J, Shulman A & Livingston G. Coping strategies and psychological morbidity in family carers of people with dementia: a systematic review and meta-analysis. Journal of Affect Disorder, 2012; 139:1–11.