Effect of a Training Program about Cognitive Behavioral Therapy on Sleep Quality among the Older Person

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Abstract

Background: Sleep problems are the most important issues that need attention, cognitive behavioral therapy has positively improved sleep quality among older person. **Aim:** To evaluate the effect of training program about cognitive behavioral therapy on sleep quality among the older persons. **Design:** A Quasi-experimental (pre and post-test). **Setting:** All geriatric clubs in Assiut city. **Sample:** 81 older person aged from (60 to 70 and more) who complained from sleeping problems. **Tools:** I. Personal characteristics, II. Comorbidities questionnaire, III. Pittsburgh sleep quality index to measure the quality and patterns of sleep, IV. Epworth sleepiness scale to measure daytime sleepiness and diagnoses sleep disorders, V. Geriatric anxiety scale and VI. Geriatric depression scale. **Results**: Musculoskeletal problems were most prevalent with 50.6% followed by high blood pressure 48.1%. Epworth sleepiness scale was affected by sex and living status in preprogram P-value= 0.027 and 0.003 while not affected in post-program P-value=0.307 and 0.056; moreover, affected by high blood pressure and pulmonary diseases in pre and post program. Pittsburgh sleep quality index affected by practicing exercise in preprogram P-value=0.019 and wasn't significance in post program P-value=0.252, it affected by heart diseases in preprogram P-value=0.000 while with pulmonary diseases and diabetes mellitus in post program P-value=0. 042 and 0.007. **Conclusion:** These results support the use of training cognitive behavioral therapy for improving sleeping quality. Training program about cognitive-behavioral therapy for improving sleep quality is recommended for older adults.

Keywords: Cognitive behavioral therapy, Effect, Sleep quality, Training program, Older person

Introduction:

Sleep is vital process linked to neural restoration and physiological maintenance across multiple systems; sleep quality is declining with advanced aging **(Cooke & Ancoli-Istael, 2015 and Cox & OAlatunji, 2016)**. It is estimated that nearly 67% of older person have at least one sleep related complaint and about 40% of people above 60 years complain the difficulty in falling asleep or staying asleep; the most common sleep problems in the older person include insomnia, sleep rhythm disorders, excessive daily drowsiness, sleep apnea and restless legs syndrome **(Abd Allah et al., 2019 and Taheri Tanjani et al; 2019)**.

Based on previous literatures as **(Azri et al., 2016)** confirmed that poor sleep quality in older persons is due to environment, pain and chronic illness. As well as **(Abbasi et al; 2019)** reported that the risk factors of sleep problems

in older persons may be connected with aging, gender, obesity, the use of sedating medications, alcohol consumption, family history, race, smoking and upper airway configuration. In the same regard **(El-Gilany et al., 2017)** added that quality of sleep can be affected by lower educational level, not working, financial dependency and presence of comorbid diseases.

Sleep problems have wide ranging impact on older person's quality of life including decreased resilience to stress and increase in irritability **(Kim et al., 2017)**. In addition, sleep deprivation increases the risk of accidents, falls, depression, chronic fatigue, delays healing of wounds and impairs functions of senses, it can reduce hypothalamic function cause hypertension, increase the risk of cardiovascular events and adversely affect the function of the metabolic, endocrine and immune systems **(Mirzaei et al., 2017 and Lemrasky et al., 2019)**.

In a study carried out by (**Blackman et al., 2020**) reported that there are many ways to overcome sleep problems including pharmacological and non-pharmacological treatments. Pharmacological methods particularly in older person include the potential for side effects, interactions and polypharmacy; hence, interest in non-pharmacological sleep-modifiers such as Cognitive Behavioral Therapy (CBT) is intensifying with recent technological advances permitting exploration of novel approaches (**Rodriguez et al., 2015**).

Cognitive Behavioral Therapy is a short-term psychological intervention with well-established evidence-based treatment and have been found efficacy in patients with primary insomnia and it is typically carried out in a face-to face individually (**Trockel et al., 2015 and Wantonoro, 2020**).

Cognitive Behavioral Therapy (CBT) consists of several items; stimulus control (to overcome conditioning between wake and the bedroom environment); sleep restriction (to reduce the time spent awake in bed by matching total time in bed with estimated sleep duration); cognitive therapies (e.g. regarding dysfunctional attitudes and beliefs towards sleep); sleep hygiene (to promote healthy behaviors and a conducive environment to improve sleep quality) and relaxation training (**Cunninghama &Shapirobc, 2018 and Ng and Cunnington, 2021**).

Nurses have an important role in sleep problems recognition and management, meanwhile; applying related interventions is known as a nursing priority, design and implementation of appropriate educational and training programs can have a valuable role in improving the knowledge and behavior of older person to minimize the occurrence of sleep problems (**Irish et al., 2015**). According to the published literature, little research has assessed the effect of cognitive educational and training interventions on improving sleep quality of older persons in Egypt; therefore, this study was conducted.

Aim and study hypothesis:

The study carried out to evaluate the effect of a training program about cognitive behavioral therapy on sleep quality among the older person in geriatric clubs at Assiut City.

- **Null hypothesis:** Training program about cognitive behavioral therapy will not improve sleep quality among older person in geriatric clubs.
- **Alternative hypothesis (H1):** Training program about cognitive behavioral therapy is expected to improve sleep quality among older person in geriatric clubs.

Subjects and method

Research design: A Quasi-experimental (pre- and post-test) research design which defined by **Rogers and Revesz, 2019** as "a form of quasi-experimental research that allows for uncomplicated assessment of an intervention applied to a group of study participants or meaning there is testing of a dependent variable (knowledge or attitude) before and after intervention with an independent variable (training or an information presentation session)."

Setting:

Assiut city has three geriatric clubs namely Almarkaz Althaqafiu Alaslamiu, Aljameiat Alshareia, and Nadi Almysiniyn Bialarbaeayn; these clubs are organized to fulfill the interests of the elderly by providing different activities for them as physical, psychological, psychosocial, rehabilitative services, meals (lunch) and some kind of recreational activity. Participants were recruited from all the three clubs mentioned above.

Sample:

The total number of three previously mentioned geriatrics clubs' members was 200; total coverage sampling was including 81 older person who complained from sleeping problems without significant neurological or cognitive problems that could interfere with effectiveness of the program.

Study tools:

Structured interview questionnaire sheet composed from six tools utilized to collect data for this study:

Tool (I): personal characteristics of older person; age, sex, residence, educational level, marital status, living alone and practicing exercise.

Tool (II): Comorbidities Questionnaire:

This developed at 1987 by **Charlson, et al.,** to summarize efficiently one or multiple comorbidities into a single score in an efficient

manner, it included patient problem as DM, heart diseases, hypertension, osteoarthritis, osteoporosis, back pain and others.

Reliability was estimated by α Cronbach's test to test internal consistency and its result was equal to 0.76.

Tool I and II were used one time throughout study, only before starting of the program.

Tool (III): The Pittsburgh Sleep Quality Index (PSQI):

This scale developed by **Buysse, et al., 1989**, the scale consists of 13 questions to measure the quality and patterns of sleep in the older adult. It separates "poor" from "good" sleep by measuring seven domains: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleep medication and daytime dysfunction over the last month. Scoring of the responses was based on a 0 to 3 points, 0= never, 1=rarely, 2=mostly and 3=always. Reliability was estimated by α Cronbach's test to test internal consistency and its result was equal to 0.87.

Tool (IV): The Epworth Sleepiness Scale (ESS):

This scale was developed by **Johns, (1991)** which widely used to measure daytime sleepiness and diagnoses sleep disorders. ESS consists of 8 questions; despondence is asked to rate, on a four-points scale (0 to 3) 0= never, 1=rarely, 2=mostly and 3=always; their usual chances of dozing off or falling asleep while engaged in eight different activities. Reliability was estimated by α Cronbach's test to test internal consistency and its result was equal to 0.86.

Tool (V): Geriatric Anxiety Scale (GAS):

It developed by **Mueller et al., 2015** included 30 questions divided to three subscales: Somatic subscale, cognitive subscale and Affective subscale. It involving of four responses ranging from 0 to 3, with Not at all = 0; sometimes= 1; most of the time= 2; all of the time= 3; possible score is sum of items 1 through 25. Items 1 through 25 are scorable items. Each item ranged from 0 to 3. Each item loaded on only one scale. Items 26 through 30 are used to help researchers identify area of concern for the respondents they are not used to calculate the total score of GAS or part of any subscale. That is, the content items are not

scored on the measures. Reliability was estimated by α Cronbach's test to test internal consistency and its result was equal to 0.78.

Tool (VI): Short Form Geriatric Depression Scale (GDS):

This scale developed by **Malakouti et al., 2006;** it included 15 questions to measure depression severity in older person with yes/no response. The 10 items from total indicated the presence of depression when answered positively, while the five questions indicated depression when responded negatively. Reliability was estimated by α Cronbach's test to test internal consistency and its result was equal to 0.85.

Tools III, IV, V and VI were done two times for older person, the first time before starting of training program, the second time after three months of program completion.

Validity of the tools:

Checked and revised by panel of three experts from nursing sciences at Assiut University who reviewed the instruments for clarity, relevance, comprehensiveness, understanding and applicability.

Administrative design:

An official approval letter containing brief explanations of the study purpose was signed from the Dean of Nursing Faculty-Assiut University which sent to the directors of geriatric clubs.

Ethical considerations:

The research proposal was approved by Ethical Committee of the Nursing Faculty at Assiut University. There was no risk on the study subjects during application of the research. The study followed common ethical principles in research; oral consent was received from the older person who accepted to participate in the study after explaining the nature and aim of the study. Confidentiality and anonymity were assured, and study subjects had the right to refuse the participation or withdraw from the research at any time without giving reasons.

Pilot study:

A pilot study was done on 10% (8) of the older person which included in the study sample because there wasn't modification in the tools. The purpose of this study was to

ensure the clarity of items, test for the comprehension, applicability, relevance of the tools and estimate the time required for data collection.

Method: This study was carried out on four phases:

A) Assessment phase:

The study tools were collected after extensive review of literature. Assessment of every participant (pretest) was completed using all study six tools.

B) Planning phase: This phase included the arrangement for the conduction of the program such as: Teaching place, time, sessions, methods and materials.

- *Teaching place:* The program was conducted in the garden or reception of geriatric clubs

- *Teaching Time:* The time of the program decided according to suitable time for the participants and the researchers.

- *Sessions:* The contents of the program divided into two sessions for every group. Each session took 30-45 minutes. The study sample was divided into 16 groups in a variety of numbers ranged between 5-6 older person in each group.

- *Teaching methods and materials*: The researchers used simple teaching methods as: Lecture, discussion. The used media was included power point presentation, video and handouts regarding training of cognitive behavior therapy prepared by the researchers and distributed to every older person at the end of the program.

C) Implementation phase:

Based on the findings of the assessment, CBT program was applied for older person who suffered from sleep problem (81). **The first session:** The researchers began this session with explaining the importance of CBT for improving sleep quality among older person. Then they received the basic knowledge about sleep problems include types, physiological changes that affect sleep, nutrition that promote healthy sleep and risk factor that interfere with sleep quality.

The second session: At this time, instructions and training about the components of CBT (stimulus control therapy, sleep restriction, sleep hygiene guidelines, sleep environment improvement, relaxation training

and remaining passively awake) was given to the older person, then the researchers distributed illustrating pictures and handouts and spent 10 minutes in summarizing the contents of the program.

Components of Cognitive Behavioral Therapy (CBT):

- **Stimulus control therapy:** This method helps remove factors that ailment elderly mind to resist sleep. For example, they might be coached to set a consistent bedtime and wake time and avoid naps, use the bed only for sleep and leave the bedroom if can't go to sleep within 20 minutes, only returning when sleepy.

- **Sleep restriction:** Lying in bed when awake can become a habit that leads to poor sleep. This treatment reduces the time spend in bed, causing partial sleep deprivation, which lead to be tired the next night. Once sleep has improved, the time in bed is gradually increased.

- **Sleep Hygiene Guidelines:** This method of therapy involves changing basic lifestyle habits that influence sleep, such as screen time (turn off TV, computers, tablets and smart phones one hour before bedtime) smoking or drinking too much caffeine late in the day, drinking too much alcohol, or not getting regular exercise. It also includes tips that help for sleep better, such as ways to wind down an hour or two before bedtime, hot baths, eating a light bedtime snack, such a glass of warm milk, cheese, or a bowl of cereal.

- **Sleep environment improvement:** This offers ways that create a comfortable sleep environment, such as keeping bedroom quiet, dark and cool, not having a TV in the bedroom, and hiding the clock from view.

- **Relaxation training:** This method helps mind and body calm. Approaches include meditation, imagery and muscle relaxation

- **Remaining passively awake:** Also called paradoxical intention, this involves avoiding any effort to fall asleep. Paradoxically, worrying that can't sleep can actually keep awake. Letting go of this worry can help in relax and make it easier to fall asleep.

- The researchers followed the older person adherence with CBT training program and

monitoring their progress either by personal interviewing or telephone.

- The CBT training program lasted 9 months started from first of February to the end of October 2021.

D) Evaluation phase:

- During this phase the researchers filled-out tool III, IV, V and VI for older person after three months from implemented cognitive behavioral therapy training program to evaluate its effectiveness on improving sleep quality.

Statistical analysis

Data entry and data analysis were done using SPSS version 22 (Statistical Package for Social Science). Data were presented as number, percentage, mean and standard deviation. Independent samples t-test was used to compare quantitative variables between two groups and ANOVA test was used for more than two groups. Paired samples t-test was done to compare quantitative data between before and after the program. P-value considered statistically significant when P < 0.05.

Results:

The findings show the characteristics of older person; 56.8% were male, 13.6% had university education or higher, 72.8% were married, 29.6% lived alone and 92.5% were practicing walking exercises. Table (1) is presenting the characteristics of the older person.

The findings of present study reveal that heart disease was prevalent among 42.0% of the participated older person. Moreover; it also shows that 48.1% had high blood pressure, 27.2% were diabetic and 50.6% had Musculo-skeletal problems. Figure (1) presents comorbidities among the studied older person.

The current findings regarding the M±SD of Pittsburgh sleep quality Index in pre and post-program found that M± SD=1.98±0.51cannot get to sleep within thirteen minutes in preprogram and 0.95±0.43 in post program, M±SD=2.16±0.77 for walkup in the middle of the night or early morning in preprogram and 1.04±0.30 in post program and1.95±0.72 for have to get up to use the bath room and 0.95±0.35 in post program. There were statistically significance differences. Table (2) shows M±SD of Pittsburgh sleep quality Index in pre and post-program.

The findings regarding the mean of Epworth sleepiness scale in pre and post-program found that M±SD=1.54±0.49 for setting and reading in preprogram became 1.14±0.42 post program, 1.89±0.62 for watching T.V in preprogram and 1.49±0.51 post program and 2.02±0.65 for lining down to rest in the afternoon raised to be 1.46±0.41 post program. There were statistically significance differences. M±SD of Epworth sleepiness scale in pre and post-program is presented in Table (3).

The findings regarding mean scores of Geriatric Anxiety Scale in pre and post-program such as1.70±0.50 for had an upset stomach in preprogram raised to 0.81±0.37 in post program, 1.28±0.33 for afraid of being judged by others in preprogram and 0.62±0.24 in post program, 1.60±0.49 for had difficulty falling asleep in preprogram and 0.62±0.20 in post program and 1.41±0.56 for afraid of dying in pre-program became 0.54±0.25 post program. There were statistically significance differences. Table (4) shows mean scores of Geriatric Anxiety Scale in pre and post-program.

Furthermore; the results of study disclosed that there were statistically significance differences between some of mean of the Geriatric Depression Scale scores as 0.60±0.29 for feel life is empty in preprogram 0.40±0.29 in post program, 0.63±0.29 for often feel helpless in preprogram became 0.38±0.29, 0.64±0.28 for prefer to stay at home rather than going out and doing new things M±SD in pre-program and 0.31±0.27 in post program. On the other hand, 0.58±0.30 for feel happy most of the time in preprogram 0.59±0.29 in post program, 0.59±0.29 for think it is wonderful to be a life now in preprogram became 0.41±0.29 in post program and 0.51±0.30 for feel full of energy in preprogram and 0.59±0.29 in post program. There weren't statistically significance differences between some variable of mean scores of the scale as. Mean of the Geriatric Depression Scale scores shows in Table (5).

The findings regarding the means scores of Pittsburgh sleep quality index, Epworth sleepiness scale, geriatrics anxiety scale and geriatric depression scale scores in pre and post program. there were statistically significance differences between all scales mean scores among older persons. Table (6) represents the relation between

mean scores of scales among the studied older person in pre and post-program.

The findings of mean scores of scales and characteristics of older persons found that mean scores of Epworth sleepiness scale was affected by sex and living status of older persons in preprogram. Also, mean scores of geriatrics anxiety and depression scales was affected by living status of the older person. There were statistically significance differences. Relation between mean scores of the scales and characteristics of older persons in preprogram is shown in Table (7).

The findings discloses that the mean scores of scales and clinical data among the older person in preprogram signifies that mean scores of Pittsburgh sleep quality index, Epworth sleepiness scale and geriatrics anxiety scale was affected by the presence of heart diseases. Also, mean scores of Pittsburgh sleep quality index and geriatrics anxiety scale with the presence of diabetes mellitus and pulmonary diseases. As mean scores of geriatric depression scale were affected by hypertension and musculoskeletal. There were statistical significance differences. Table (8) presents the relation between the mean scores of scales and clinical data among the older person in preprogram.

The findings regarding the mean scores of scales and characteristics of older person found that mean scores of geriatrics anxiety scale was affected by living status and geriatric depression scale by practicing of exercises. There were statistically significance differences. Relation between mean scores of scales and older person's characteristics in post program in Table (9).

The findings regarding the mean scores of scales and the older person clinical data in post program Epworth sleepiness and geriatrics anxiety scales was affected by high blood pressure and pulmonary diseases. As Pittsburgh sleep quality index was affected by pulmonary diseases and diabetes mellitus. There were statistically significance differences. Table (10) shows the relation between the mean scores of scales and clinical data of the older person in post-program.

Table (1): Descriptive distribution of the older person's characteristics no= 81

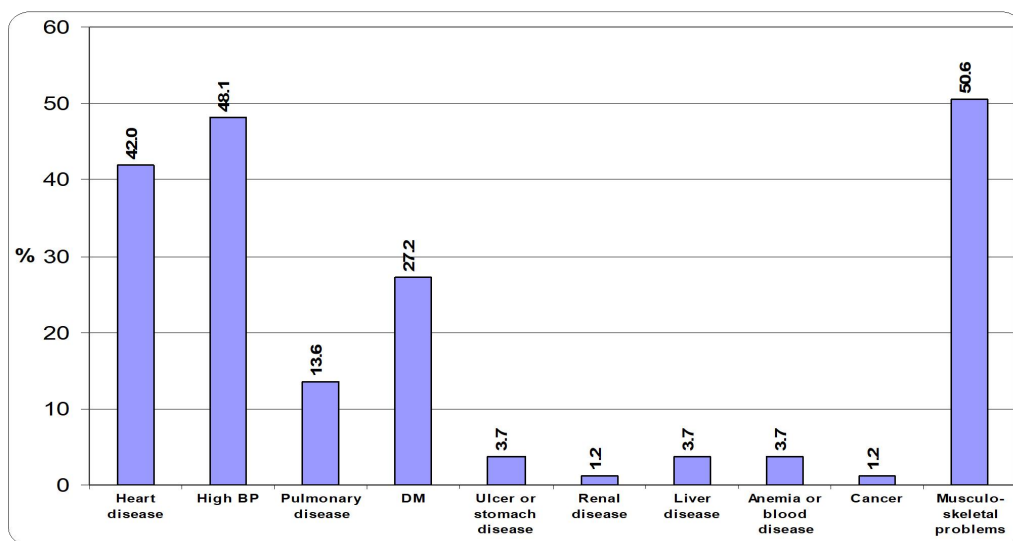| Personal characteristics	No	%
Age (years):		
60 - < 65	28	34.6
65 - < 70	27	33.3
≥ 70	26	32.1
Mean ± SD (Range)	67.05 ± 5.83 (60.0-87.0)	
Sex:		
Male	46	56.8
Female	35	43.2
Educational level:		
Illiterate	18	22.2
Read & write	19	23.5
Basic education	20	24.7
Secondary	13	16.0
University or higher	11	13.6
Marital status:		
Single	6	7.4
Married	59	72.8
Widow	16	19.8
Living alone:		
Yes	24	29.6
No	57	70.4
Practice of exercises:		
Yes	53	65.4
No	28	34.6
#**Types of exercises:**		
Walking	49	92.5
Cycling	3	5.7
Range of motion	9	17.0

More than one answer was selected

Figure (1): Distribution of comorbidities among older person, no= 81.

Table (2): The mean score of Pittsburgh sleep quality Index among older person in pre and post-program, no= 81.

Items	Pre-program	Post-program	P-value
	Mean ± SD	Mean ± SD	
Cannot get to sleep within 30 minutes	1.98 ± 0.51	0.95 ± 0.43	**0.001***
Wake up in the middle of the night or early morning	2.16 ± 0.77	1.04 ± 0.30	**0.000***
Have to get up to use the bathroom	1.95 ± 0.72	0.95 ± 0.35	**0.000***
Cannot breathe comfortably	1.69 ± 0.57	0.86 ± 0.34	**0.000***
Cough or snore loudly	1.68 ± 0.65	0.89 ± 0.41	**0.000***
Feel too cold	1.85 ± 0.61	0.89 ± 0.33	**0.000***
Feel too hot	1.54 ± 0.43	0.73 ± 0.31	**0.004***
Have bad dreams	1.79 ± 0.54	0.72 ± 0.46	**0.000***
Have pain	2.17 ± 0.69	0.95 ± 0.31	**0.000***
During the past month, how often have you taken medicine (prescribed or "over the counter") to help to sleep?	1.74 ± 0.50	0.88 ± 0.35	**0.000***
During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?	2.09 ± 0.70	0.91 ± 0.47	**0.000***
During the past month, how much of a problem has it been for you to keep up enthusiasm to get things done?	1.74 ± 0.51	0.70 ± 0.32	**0.001***
During the past month, how would you rate your sleep quality overall?	2.00 ± 0.63	0.93 ± 0.49	**0.000***

Paired samples t-test

Table (3): The mean score of Epworth sleepiness scale among older person in pre and post-program n=81

Items	Pre-program	Post-program	P-value
	Mean ± SD	Mean ± SD	
Sitting and reading	1.54 ± 0.49	1.14 ± 0.42	**0.003***
Watching T.V.	1.89 ± 0.62	1.49 ± 0.51	**0.003***
Sitting inactive in public place (theater or meeting)	1.67 ± 0.56	1.25 ± 0.48	**0.005***
Passenger of care for an hour without a break	1.60 ± 0.59	1.07 ± 0.37	**0.000***
Lying down to rest in the afternoon	2.02 ± 0.65	1.46 ± 0.41	**0.000***
Sitting and talking to someone	1.75 ± 0.49	1.19 ± 0.30	**0.000***
Sitting quietly after lunch	2.06 ± 0.68	1.33 ± 0.48	**0.000***
In a car, when stopped for a few minutes in traffic	1.72 ± 0.59	1.01 ± 0.38	**0.001***

Paired samples t-test

Table (4): The mean score of Geriatric Anxiety Scale among older person in pre and post-program, n=81

Items	Pre-program	Post- program	P-value
	Mean ± SD	Mean ± SD	
My heart raced or beat strongly	1.31 ± 0.49	0.73 ± 0.39	**0.001***
My breath was short	1.47 ± 0.47	0.70 ± 0.27	**0.000***
Had an upset stomach	1.70 ± 0.50	0.81 ± 0.37	**0.000***
Felt like things were not real or like I was outside of myself	1.48 ± 0.61	0.69 ± 0.23	**0.000***
Felt like losing control	1.49 ± 0.49	0.59 ± 0.37	**0.001***
Afraid of being judged by others	1.28 ± 0.33	0.62 ± 0.24	**0.005***
Afraid of being humiliated or embarrassed	1.30 ± 0.49	0.56 ± 0.31	**0.000***
Had difficulty falling asleep	1.60 ± 0.49	0.62 ± 0.20	**0.000***
Had difficulty staying asleep	1.78 ± 0.65	0.80 ± 0.32	**0.003***
Felt irritable	1.52 ± 0.42	0.70 ± 0.36	**0.000***
Had outbursts of anger	1.57 ± 0.52	0.80 ± 0.48	**0.000***
Had difficulty concentrating	1.67 ± 0.44	0.73 ± 0.33	**0.005***
Easily startled or upset	1.67 ± 0.52	0.78 ± 0.39	**0.000***
less interested in doing something I typically enjoy	1.59 ± 0.48	0.69 ± 0.31	**0.000***
Felt detached or isolated from others	1.46 ± 0.45	0.67 ± 0.43	**0.000***
Felt like was in a daze	1.44 ± 0.57	0.67 ± 0.35	**0.000***
Had a hard time sitting still	1.60 ± 0.64	0.69 ± 0.35	**0.007***
Worried too much	1.75 ± 0.63	0.77 ± 0.46	**0.000***
Could not control my worry	1.54 ± 0.51	0.56 ± 0.35	**0.000***
Felt restless, keyed up, or on edge	1.64 ± 0.59	0.59 ± 0.31	**0.000***
Felt tired	1.91 ± 0.48	0.85 ± 0.47	**0.000***
Muscles were tense	1.86 ± 0.66	0.83 ± 0.37	**0.000***
Had back pain, neck pain, or muscle cramps	1.98 ± 0.41	0.86 ± 0.35	**0.001***
Felt like I had no control over my life	1.47 ± 0.55	0.57 ± 0.31	**0.000***
Felt like something terrible was going to happen to me	1.69 ± 0.54	0.62 ± 0.28	**0.000***
Concerned about my finances	1.46 ± 0.45	0.54 ± 0.23	**0.000***
Concerned about my health	1.73 ± 0.55	0.74 ± 0.37	**0.000***
Concerned about my children	1.93 ± 0.61	0.69 ± 0.35	**0.000***
Afraid of dying	1.41 ± 0.56	0.54 ± 0.25	**0.000***
Afraid of becoming burden on my family or children	1.75 ± 0.63	0.62 ± 0.30	**0.003***

Paired samples t-test

Table (5): The mean scores of geriatric depression scale among the older person in pre and post-program n=81

Items	Pre- program Mean ± SD	Post- program Mean ± SD	P-value
Satisfied with life	0.48 ± 0.30	0.73 ± 0.25	**0.001***
Dropped many of activities and interests	0.56 ± 0.30	0.41 ± 0.29	0.060
Feel that life is empty	0.60 ± 0.29	0.40 ± 0.29	**0.007***
Often get bored	0.58 ± 0.30	0.31 ± 0.27	**0.000***
Good spirits most of the time	0.53 ± 0.30	0.64 ± 0.28	0.153
Afraid that something bad is going to happen	0.63 ± 0.29	0.43 ± 0.30	**0.012***
Feel happy most of the time	0.58 ± 0.30	0.59 ± 0.29	0.874
Often feel helpless	0.63 ± 0.29	0.38 ± 0.29	**0.002***
Prefer to stay at home, rather than going out and doing new things	0.64 ± 0.28	0.31 ± 0.27	**0.002***
Feel have more problems with memory than most	0.58 ± 0.30	0.41 ± 0.29	**0.001***
Think it is wonderful to be alive now	0.59 ± 0.29	0.41 ± 0.29	0.078
Feel pretty worthless the way you are now	0.48 ± 0.30	0.40 ± 0.29	**0.018***
Feel full of energy	0.51 ± 0.30	0.59 ± 0.29	0.270
Feel that situation is hopeless	0.70 ± 0.26	0.35 ± 0.28	**0.000***
Think that most people are better off than you are	0.56 ± 0.30	0.31 ± 0.27	**0.001***

Paired samples t-test

Table (6): Relation between mean scores of scales among the older person in pre and post-program n= 81

Scales scores	Preprogram Mean ± SD	Post-program Mean ± SD	P-value
Pittsburgh Sleep Quality Index	24.57 ± 7.82	11.31 ± 3.21	**0.000***
Epworth sleepiness	14.26 ± 3.52	9.94 ± 2.89	**0.002***
Geriatric Anxiety	39.79 ± 11.56	17.49 ± 5.82	**0.000***
Geriatric Depression	8.46 ± 2.17	5.57 ± 1.85	**0.007***

Paired samples t-test

Table (7): Relation between mean scores of scales and characteristics of older person in preprogram n= 81

Personal characteristics	PSQI scale Mean ± SD	Epworth sleepiness scale Mean ± SD	GAS Mean ± SD	Geriatric depression scale Mean ± SD
Age (years):				
60 - < 65	23.43 ± 4.62	14.04 ± 4.25	37.29 ± 11.18	7.71 ± 2.18
65 - < 70	23.85 ± 6.49	13.15 ± 4.76	37.74 ± 12.23	8.15 ± 2.49
≥ 70	26.54 ± 5.21	15.65 ± 4.46	44.62 ± 14.70	9.58 ± 2.53
P-value	0.294	0.249	0.158	0.079
Sex:				
Male	25.41 ± 5.30	15.43 ± 3.86	40.54 ± 14.81	8.09 ± 2.37
Female	23.46 ± 6.44	12.71 ± 4.00	38.80 ± 12.92	8.94 ± 2.86
P-value	0.268	**0.027***	0.620	0.230
Educational level:				
Illiterate	23.06 ± 6.79	11.94 ± 3.23	37.06 ± 12.71	8.83 ± 2.19
Read & write	26.32 ± 6.89	16.26 ± 4.08	45.26 ± 13.03	9.21 ± 2.55
Basic education	26.15 ± 5.12	16.00 ± 4.48	42.40 ± 12.25	8.55 ± 3.02
Secondary	24.69 ± 4.12	13.23 ± 3.39	37.38 ± 13.82	7.69 ± 2.54
University or higher	21.00 ± 5.46	12.64 ± 4.06	32.91 ± 11.80	7.27 ± 2.90
P-value	0.320	0.055	0.204	0.464
Living alone:				
Yes	26.50 ± 4.49	17.04 ± 4.30	45.50 ± 12.90	9.54 ± 2.15
No	23.75 ± 6.23	13.09 ± 3.58	37.39 ± 12.05	8.00 ± 2.42
P-value	0.150	**0.003***	**0.031***	**0.045***
Exercise:				
Yes	26.04 ± 5.04	14.79 ± 4.22	40.77 ± 12.17	8.06 ± 2.51
No	21.79 ± 6.58	13.25 ± 3.00	37.93 ± 11.39	9.21 ± 2.25
P-value	**0.019***	0.234	0.437	0.118

Independent samples t-test   ANOVA test

Table (8): Relation between mean scores of scales and clinical data among the older person in preprogram n=81

Clinical data	PSQI scale	Epworth sleepiness scale	GAS	Geriatric depression scale
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Heart diseases:				
Yes	28.44 ± 6.36	16.00 ± 5.25	49.35 ± 12.64	9.21 ± 2.48
No	21.77 ± 7.63	13.00 ± 4.42	32.87 ± 10.78	7.91 ± 3.51
P-value	**0.000***	**0.015***	**0.000***	0.070
High BP:				
Yes	25.26 ± 8.38	15.87 ± 4.86	44.77 ± 17.15	9.59 ± 2.79
No	23.93 ± 7.31	12.76 ± 3.72	35.17 ± 11.43	7.40 ± 3.16
P-value	0.449	**0.010***	**0.005***	**0.002***
Pulmonary diseases:				
Yes	31.09 ± 4.28	15.82 ± 5.06	52.45 ± 10.59	7.73 ± 3.64
No	23.54 ± 7.77	14.01 ± 4.58	37.80 ± 11.33	8.57 ± 3.10
P-value	**0.002***	**0.316**	**0.003***	0.415
DM:				
Yes	28.27 ± 5.78	15.95 ± 4.69	48.00 ± 13.19	9.27 ± 2.88
No	23.19 ± 8.07	13.63 ± 3.36	36.73 ± 12.36	8.15 ± 3.24
P-value	**0.008***	**0.091**	**0.003***	0.158
Musculoskeletal problems:				
Yes	23.34 ± 7.93	13.44 ± 3.94	34.27 ± 11.24	7.56 ± 3.53
No	25.82 ± 7.60	15.10 ± 4.99	45.45 ± 14.96	9.38 ± 2.47
P-value	0.154	0.177	**0.001***	**0.009***

Independent samples t-test

Table (9): Relation between mean scores of scales and older person's characteristics in post program n=81

Characteristics	PSQI scale	Epworth sleepiness scale	GAS	Geriatric depression scale
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Age (years):				
60 - < 65	11.07 ± 3.56	9.96 ± 3.24	17.11 ± 5.02	5.93 ± 2.21
65 - < 70	10.89 ± 3.18	8.74 ± 2.50	15.81 ± 4.87	5.15 ± 1.89
≥ 70	12.00 ± 2.97	11.15 ± 3.64	19.65 ± 6.24	5.62 ± 1.40
P-value	0.713	0.077	0.277	0.599
Sex:				
Male	11.20 ± 2.51	10.33 ± 3.47	17.83 ± 5.78	5.20 ± 1.74
Female	11.46 ± 2.85	9.43 ± 3.39	17.06 ± 5.48	6.06 ± 1.95
P-value	0.824	0.307	0.700	0.179
Educational level:				
Illiterate	10.78 ± 2.44	8.67 ± 2.72	15.33 ± 4.61	6.06 ± 1.80
Read & write	12.32 ± 2.94	10.53 ± 3.75	20.58 ± 5.17	5.74 ± 2.48
Basic education	11.00 ± 2.46	11.70 ± 2.90	18.60 ± 6.76	5.40 ± 2.16
Secondary	11.85 ± 2.93	8.85 ± 2.44	15.08 ± 5.21	4.69 ± 1.98
University or higher	10.36 ± 3.59	9.09 ± 2.99	16.55 ± 5.55	5.82 ± 1.93
P-value	0.840	0.088	0.309	0.749
Living alone:				
Yes	13.00 ± 3.66	11.21 ± 3.44	22.58 ± 7.44	5.38 ± 1.67
No	10.60 ± 3.30	9.40 ± 2.98	15.35 ± 5.13	5.65 ± 1.94
P-value	0.057	0.056	**0.001***	0.695
Exercise:				
Yes	11.79 ± 3.25	9.55 ± 3.30	16.72 ± 5.42	4.87 ± 1.54
No	10.39 ± 3.09	10.68 ± 3.81	18.96 ± 5.48	6.89 ± 1.96
P-value	0.252	0.216	0.278	**0.002***

Independent samples t-test   ANOVA test

Table (10): Relation between the mean scores of scales and clinical data of the older person in post-program n=81

Clinical data	PSQI scale	Epworth sleepiness scale	GAS	Geriatric depression scale
	Mean ± SD	Mean ± SD	Mean ± SD	Mean ± SD
Heart diseases:				
Yes	12.38 ± 3.42	10.91 ± 3.59	19.94 ± 6.61	5.85 ± 1.68
No	10.53 ± 3.01	9.23 ± 2.99	15.72 ± 4.83	5.36 ± 1.97
P-value	0.115	0.055	**0.033***	0.447
High BP:				
Yes	11.51 ± 3.58	11.51 ± 3.74	19.67 ± 5.26	5.79 ± 1.80
No	11.12 ± 2.90	8.48 ± 2.47	15.48 ± 4.97	5.36 ± 1.90
P-value	0.736	**0.000***	**0.032***	0.493
Pulmonary diseases:				
Yes	14.27 ± 3.86	12.45 ± 3.27	24.73 ± 6.31	5.64 ± 2.04
No	10.84 ± 3.80	9.54 ± 2.85	16.36 ± 5.39	5.56 ± 1.84
P-value	**0.042***	**0.020***	**0.003***	0.932
DM:				
Yes	13.82 ± 2.47	9.50 ± 2.33	20.23 ± 6.01	5.73 ± 1.93
No	10.37 ± 3.19	10.10 ± 3.74	16.47 ± 5.19	5.51 ± 1.84
P-value	**0.007***	0.540	0.088	0.760
Musculoskeletal problems:				
Yes	11.17 ± 3.46	10.61 ± 3.97	16.93 ± 5.24	5.37 ± 2.06
No	11.45 ± 4.00	9.25 ± 2.74	18.08 ± 4.43	5.78 ± 1.64
P-value	0.811	0.117	0.561	0.521

Independent samples t-test

Discussion:

Sleep problems represent a major concern among older person related to its association with many health hazards **(Khagi et al., 2019 and Mirchandaney et al., 2022)**. Cognitive behavioral therapy is a safe alternative of pharmacotherapy especially for older person to treatment sleep disorders, recent studies have indicated that CBT for insomnia also effectively treat insomnia in older adults with comorbid medical conditions **(Melo et al, 2019, Denis et al., 2020 and Dangol et al., 2020).**

The study aimed to evaluate the effect of a training program about cognitive behavioral therapy on sleep quality among the older person in geriatric clubs at Assiut City.

The present study showed that the Mean± SD age of the participants was 67.05 ± 5.83, more than half of them were males, about one quarter were had basic education, more than two thirds were married and not living alone, this findings similar with study about the impact of the educational intervention on sleep quality and psychological well-being among the elderly people carried by **Kaveh et al., (2021)** who reported more than half of studied

sample were male while disagreed with the results related to education and marital who stated that more than one quarter and all the studied sample had secondary education and married.

The present study revealed that musculoskeletal disease was prevalent among half of the participates, followed by more than two fifths high blood pressure, heart disease and more than one quarter of the them were diabetic. This disagreed with **Shrestha et al., (2017)** who carried study about **"prevalence and contributing factors of insomnia among elderly of Pashupati old aged home"** and **Lovato et al., (2014)** who study evaluation of a brief treatment program of cognitive behavior therapy for insomnia in older adults and reported that more than three- quarters of participates were hypertensive and more than half of them were diabetics.

Also, inconsistent with **Abd Allah et al., (2016)** who conducted study about "cognitive behavioral intervention to improve sleep quality in older adults" and reported that two thirds of participates had high blood pressure, more than half were diabetic and nearly half had arthritis.

Regarding to PSQI among the participates pre and post program; the present study cleared that there was statistically significant difference (P value=0.000) in pre and post program. This finding supported alternative hypothesis (H1). This observation was congruent with the results reported by **Richter et al., (2014)** who study treating comorbid insomnia in older adults via cognitive-behavioral treatment and showed an improvement in sleep quality. Whereas **Lemrasky et al., (2019)** who conduct a study to evaluate the effect of sleep hygiene education on the Quality of Sleep of Elderly Women and founded that there was significant improvement of total score PSQI (P-value=0.007). In addition to **El Kady et al., (2012)** who study cognitive behavioral therapy for institutionalized elders complaining of sleep disturbance in Alexandria, Egypt who reported that increase score of PSQI of the studied group in pretest over in posttest.

Also, the same results approved by **Gebhart et al., (2011)** who studied "moderate exercise plus sleep education improves self-reported sleep quality, daytime mood and vitality in adults with chronic sleep complaints" and **Shrestha et al., (2017)** who founded that there was improvement in post program. In addition, **Abd Allah et al., (2016) and Kaveh et al., (2021)** who mentioned that there were post-intervention statistically significant improvements in PSQI. The current study referred to there was statistically significant difference related to Epworth sleepiness score (P value=0.002) in pre and post program application.

According to Geriatric Anxiety & Depression Scales in the current study, it was observed that there were statistically significance differences between mean score pre and post program (P-value=0.000 and 0.007) respectively, this may be due to CBT improve sleep quality which had direct and indirect impact on mood status and depression among elderly participants. This agreed with **Wennberg et al., (2013)** who revealed a significant reduction of day-time sleepiness and depressive symptoms of the studied older adults, as well as their overall psychological condition fatigue and anxiety. As well as **Glozier et al., (2019)** who assessed Adjunctive Internet-delivered cognitive behavioral therapy

for insomnia in men with depression and concluded that there was a statistically significant effect on insomnia symptoms.

As regard relation between age group of the studied sample and PSQI it was observed that there was no statistically significant difference between them P=0.294, this may be due to there are many factors not only age affect sleep status among elderly, this similar to **El Kady et al., (2012) and Lemrasky et al., (2019)** who reported that there was no statistically significant difference between age group of the studied sample and PSQI (P-value=0.990 and 0.082) respectively. Also, **Lemrasky et al., (2019)** agreed with the results of the present study which revealed that there were statistically significant differences between PSQI, marital educational level and living alone.

In the present study noticed that there was statistically significant difference between sex and Epworth sleepiness scale (P value=0.027), this because elderly female had more tend to stay at their homes rather than elderly males. This disagreed with **Lovato et al., (2014)** who founded that there was no statistically significant difference between sex and Epworth sleepiness scale (P value=0.220).

The finding of current study revealed there was statistically significant difference between level of PHQ, GAS and living status of the participants P value=0.022 & P value=0.001, as elderly participants who lived with other family member achieved lower mean score of GAS, this may be contributed to caregivers who lived with elderly can pay more attention to elderly health level and can relief some stress and anxiety level among elderly. Same findings to these results were reported by **Aritake et al., (2015) and Bankar et al., (2013)** who founded that anxiety level of the studied elderly affected by living status.

Moreover, the finding of the study concluded that there was statistically significant difference between exercises and geriatric depression scale among the participants P value=0.002, as mean score of elderly who practice walking exercise was 4.87 ± 1.54 while mean score of those who not practice walking exercise was 6.89 ± 1.96, this may be due to practicing regular walking

exercise relief tension, enhance good mood status and regulate sleep and wake cycle. This is similar to **Cheng, & Dizon, (2012)** who studied computerized cognitive behavioral therapy for insomnia and founded that elderly with no regular exercises tend to be more depressed than elderly with regular exercises P value =0.001.

Furthermore, the present study signified that there was statistically significance difference between high blood pressure & Epworth sleepiness scale P-values = 0.000, and there was statistically significance difference between pulmonary diseases and PHQ score, PSQI score, Epworth sleepiness scale and GAS score in posttest P-values = 0.000, 0.042, 0.020 and 0.003 respectively, this may be related to sleep quality deteriorates with increasing number of health conditions. This agreed with **Alessi & Vitiello, (2015)** who study insomnia (primary) in older people and implies that increasing number of chronic diseases was related to having higher PSQI score.

Also, this result was incongruent with **Bakr et al., (2012)** who found that elderly suffering from three or more chronic diseases significantly suffered insomnia more than those having a smaller number of chronic diseases. As well as a review study by **Hosseini et al., (2017)** reported that older adults with medical conditions are more likely to complain of difficulty sleeping. In the same regards **Sadler et al., (2018)** who carried out study entitled "cognitive behavior therapy for older adults with insomnia and depression and reported that cognitive behavior therapy for older adults with insomnia and depression CBT was effective method in reducing insomnia for older adults with comorbidity condition.

Conclusion:

The study concluded that cognitive behavioral therapy had various advantages for older persons whereas it had significant effect on improving sleep quality among them; so the second study hypothesis was accepted.

Recommendations:

- Training program about cognitive-behavioral therapy for improving sleep quality is recommended in community and clinical setting for older adults.

- Giving more attention to manage and dealing with sleep disorders in the older person to reduce their negative impact on their quality of life.

- Conducting future nursing research to use non-pharmacological methods to improve sleep quality among the older person.

- Replication of this study is necessary with a larger sample size to generalize the result findings.

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