

Insomnia Cognitive Behavioral Therapy Program and its Effect on Elderly Quality of Life

¹Sahar Mahmoud Sayed Ahmed El Awady,

²Eman Mohamed Ebrahim Abd-Elraziq

¹Lecturer in Community Health Nursing Department, Faculty of Nursing, Helwan University, Cairo, Egypt

²Lecturer in Gerontological Nursing Department, Faculty of Nursing, Aswan University, Cairo, Egypt

Corresponding Author: Sahar Mahmoud Sayed Ahmed El Awady

Abstract: The most prevalent sleep disorder among elderly is insomnia, which is found in different forms and affects approximately 30–50% of the elderly. The treatment strategies for sleep disorders are multivariate, as pharmacological treatments and non-pharmacological treatments; there is strong evidence and have better long-term effects. The study was **aimed** to identify insomnia cognitive behavioral therapy and its effect on elderly quality of life.

Sample: Non-probability purposive sampling technique was used for the selection of 80 elderly at Hoda Talat Harb center for geriatric rehabilitation, Dar El Syed Nafesa & Dar Omkalsou geriatric homes in Helwan city.

Tools: 3 tools were used (1) Interview questionnaire sheet include demographic characteristic, medical history of insomnia, (2) Athens insomnia scale, (3) Quality of Life Scale (QOL) sheet.

Results: There were statistically significant correlation between insomnia and QOL among elderly. Also, there was statistically significant correlation between elderly knowledge & practices and their QOL at the pre and post program where $P < 0.05$.

Conclusion: The insomnia cognitive behavioral therapy program had statistically significant improvement in elderly knowledge about insomnia and their practices regarding the daytime behavior and factors that affect sleep. Also, after applying insomnia cognitive behavioral therapy program there was statistically significant improvement in elderly quality of life.

Recommendations: Further research is needed to determine what extent interventions to improve sleep pattern and elderly QOL.

Keywords: Cognitive behavioral therapy (CBT), Insomnia, elderly, sleep disorders.

Date of Submission: 18-09-2019

Date of Acceptance: 05-10-2019

I. Introduction

Sleep is necessary for good health at all stages of life. Sleep disturbances means changes to sleep patterns which impact quality of sleep or disrupt a normal sleep cycle. Evidence for sleep alteration is established through measuring changes during sleep include electroencephalography (EEG) of brain waves, electrooculography (EOG) of eye movements, and electromyography (EMG) of skeletal muscle activity^[1,2]. Sleep disturbances causes poor concentration, reduced energy levels, changed immune function, poor wound healing, mood changes, increased risk of depression or nervousness, and greater occurrence of accidents and falls, especially in the elderly^[3].

Insomnia means persistent difficulty with sleep initiation, period, consolidation, or quality occurring despite adequate time and chance for sleep and results in some form of day time impairment. Insomnia classify according to duration episodic insomnia (symptoms last between 1 and 3 months), recurrent insomnia (when ≥ 2 episodes occur within 1 year), and acute insomnia (duration < 3 months)^[4].

Insomnia is a very common complaint among elderly and has significant long-term health consequences of them^[5,6]. Several studies have indicated that up to 50% of European individuals aged 60+ years' experience insomnia. Studies in Taiwan and mainland China found that 6% to 38% of elderly individuals experienced insomnia^[7]. A study in Malaysia revealed that 53% of elderly had insomnia^[8].

The causes of insomnia among elderly include chronic diseases, psychiatric conditions, smoking, eating too close to bedtime, daylight long naps, irregular sleep hours, asthma, nocturia, apnea, taking medications were the factors associated with insomnia among elderly, environmental and lifestyle changes. Predisposing factors of chronic insomnia are sex, age, neurotransmitter systems associated with sleep and wakefulness, and personality traits; precipitating factors (stressful events that precipitate the onset of the symptom, such as the death of a

relative or unemployment); and perpetuating factors (behaviors that perpetuate sleep problems caused by attempts to compensate for poor sleep, inadequate sleep habits, anxiety, medication, and many more)^[9].

There are several alternatives for treating insomnia in primary and secondary care settings, involve non-pharmacological approaches such as cognitive behavioral therapy for insomnia (CBT-I), are highly effective in curing chronic insomnia in elderly^[10]. The main advantages of (CBT-I), are the lack of adverse effects and its long-lasting efficacy, with the changes in behavior and beliefs allowing the benefits from this therapy to remain for a longer period of time. This is particularly appropriate in the treatment of elderly due to the chronic nature and comorbidity of insomnia at this age; behavioral techniques have been the proposed treatment approach^[11].

Several researchers have concluded that CBT should always be the first-line treatment for elderly^[1]. CBT for treating insomnia in elderly involves sleep hygiene (aims to change habits with an impact on sleep quality through psych education), sleep hygiene practices likewise include environmental factors conducive to sleep. Environmental elements include a mattress and pillow that are comfortable as well as sleeping in an environment that has the proper darkness, sound and temperature levels based on a person's individual comfort level^[12]. Relaxation techniques (reduce somatic tension and intrusive thoughts that impair sleep); and cognitive therapy (disrupts dysfunctional beliefs and attitudes about sleep that lead to emotional distress and further sleep problems)^[13].

Quality of life refer to the degree which an individual is healthy, comfortable, and able to participate in enjoy life events. It includes a stander level of psychological, physical, environmental, and social wellbeing. The ability to maintain QOL is an important aspect of aging successfully. Inappropriately, sleep problems increase in prevalence with advancing age due to a variety of factors. Research suggests that these sleep problems can negatively affect QOL in the elderly, mainly mood, cognition, and functional status. Several population based studies suggest that the effects of sleep on QOL in elderly and several population-based studies have demonstrated an association between impaired sleep and low QOL performance in the elderly^[14].

The elderly need special attention from community health nurses, because of continuous increasing numbers of them, changes in society and the need to find effective ways for promoting their health, there for the nurse practitioner (NP) who provides care for elderly plays a central role to understand the sleep changes that occur with aging, the potential causes, the consequences of disordered sleep and reducing the negative consequences of insomnia through a systematic approach for diagnosis, evaluation, and types of management strategies and their effectiveness. Therefore, insomnia among elderly warrants thorough attention from a nurse who provides care for them^[15].

Significance of study:

Insomnia impairs the individual functioning and diminishes the quality of life, as it is associated with low scores of quality of life. Insomnia is a costly medical condition and associated with increased health service utilization. The increase in the elderly population is seen world-wide. Elderly are at particular risk of insomnia. Insomnia has effect on QOL among Egyptian elderly people^[9].

A study in Egypt found that 33.4% of elderly people in Alexandria experienced insomnia^[16]. Cognitive behavioral therapy for insomnia (CBT-I), are highly effective in curing chronic insomnia in elderly^[10].

Community health nurse play an important role in managing chronic insomnia in elderly as provide them health education and learn them regular exercise can promote increased total sleep time and depth of sleep (increased slow-wave sleep) as well as decreasing sleep onset latency^[17,18].

Aim of study:

The aim of this study to assess insomnia cognitive behavioral therapy and its effect on elderly quality of life

Research hypotheses:

H (1) Insomnia cognitive behavioral therapy program will improve elderly knowledge & their practices regarding the daytime behavior and factors that affect sleep.

H (2) Quality of life for will improve after applying insomnia cognitive behavioral therapy program.

II. Subjects And Method

Study Design:

A quasi-experimental design was utilized to achieve the purpose of the present study.

Settings:

This study was conducted at Hoda Talat Harb center for geriatric rehabilitation, Dar El Syed Nafesa & Dar Omkalsan geriatric homes in Helwancity. This setting consist of (100) elderly.

Subjects:

A purposive sample was collected for a period about 6 month; it was comprised of 80 elderly (25 male and 55 female) assuming that the elderly in the previous mentioned setting from the total 100.

Sample size: was calculated using epidemiological information (EPI info.) program version 6.02

Criteria for selection of the subjects:

Inclusion criteria:

- 60 years or more
- Suffering from insomnia
- Free from communication problems (speech and hearing problems)
- Accept to participate in the study

Tools

Three tools were used in this study by the researcher for collection of necessary data and achieving the aim of the study as follows;

Tool I: A structure interview questionnaire sheet; this tool was consisted of five parts.

Part I: Socio-demographic data of the elderly

This part developed by the researchers, it was used for collection of personal data such as; age, sex, educational level, residence, monthly income and marital status based on review of related literature.

Part II: Medical history of Elderly

It involved questions about number and type of chronic diseases, the number of medication used to take daily and day time problems caused by inadequate sleep as fatigue, daytime sleepiness, stress, and dysfunction.

Part III: Habits of elderly before sleeping

It assessed the elderly habits before going to sleep like smoking, drinking tea, and eating too close to bedtime, as well as problems during sleep as reported by the elderly such as: cough, nocturia, snoring, and apnea.

Part IV: Environmental factors that affect sleeping

It was concerning with environmental factors that affect sleeping such as: excessive light, sound, and temperature variation.

Part V: Knowledge about cognitive behavioral therapy and insomnia:

This part developed by the researchers it includes meaning & types of CBT, meaning of insomnia, causes, signs & symptom, diagnoses, treatment and prevention of insomnia.

Tool II: The practices of elderly about insomnia: This tool developed by the researchers. The researchers was adapted from elderly sleep hygiene scale by **Lacks et al.**,^[19] and Athens insomnia scale (AIS) by **Soldatos et al.**,^[20] after doing modification, translation to Arabic and mixed tow scale to gain elderly practices. These practices contain 3 items as day time behavior, drinks & diet, and environmental factors.

Day time behavior: Included 7 close end questions as take a nap, smoke more than one pack of cigarettes, take medications for sleep, regular bed time and rising time, exercise strenuously within 2 hours of before bed time, apply stress management techniques before bedtime, and use bed in reading or watch TV.

Drinks & Diet: included 6 close end questions as take meal before bed time, drinking tea before bed time, energy drinks before bed time, warm drinks & Lemonade, drinks containing caffeine before bed time, and drinking cane (Cola, 7-up, sprite, Pepsi) before bed time.

Environmental factors: Contain 5 sub items like low light in bedroom, noise in bedroom, flies in bedroom, proper temperature in bedroom, and comfortable mattress and pillow.

Scoring system includes:

- It was three points for always, tow point for sometimes and one point for never.
- The total score ranged from 19-57 degree with higher scores indicated of good correct practices to decrease insomnia. Correct practice 60% or more, while incorrect practice score < 60 %.

Tool III: The QOL scale according to Maes et al.,^[21] was used to determine the level of QOL for elderly. The scale is constituted of questions and divided into 4 domains such as:

1-Physical / functioning well being :include (16) close end questions such as suffering from fever, nausea and vomiting, constipation, diarrhea, dry mouth, fatigue and restlessness, pain, orthopedic pain, arthralgia, dyspnea, neuropathy, redness, loss of activity, loss of appetite, insomnia and limited daily activity.

2-Psychological:include (8) close end question such as feeling of happiness, concentration, feeling diseased, feeling of satisfaction, feeling anxious when diagnosed with fever, feeling of anxiety, feeling of depression and feeling of satisfaction with family communications.

3- Social relationships:include (6) close end question such as social problems, effect of personal relationship on acquiring the disease, effect of health care on personal needs, dependence on others, difficult on reaching site of treatment and socioeconomic problems related to the disease.

4-Environmental : include (7) close end question such as: rubbish boxes beside the house, spreading of rubbish without boxes beside the house having plan for insects control, sanitation services, present of vegetative land beside sanitation, present of fruits and vegetables vegetation beside sanitation and presence of fast foods beside the house.

Scoring system:

The total score of quality life scale was 114 grades. Each statement was assigned a score according to elderly responses were “often”, “uncertain”, “Never” and were scored 3, 2 and 1 degree respectively.

It was classified into 3 categories:

- **High** if score $\geq 75\%$.

- **Moderate** if score $60 < 75\%$.

- **Low** if score $< 60\%$

III. Method

Validity and Reliability:

- Tools: were developed by the researcher based on recent relevant literature review except tool II& toolIII was adopted. All tools were written in English form.
- All tools were tested for content validity by five experts (jury) in the field of the study including faculty staff members from Faculty of Nursing Helwan Nursing (Community and Psychiatric Nursing Departments).assessed the tool for clarity, relevance, comprehensiveness, applicability, and understanding. The necessary modifications were done.
- Reliability testing was done using Cronbach's alpha on a sample of 10 of the subjects that measures the degree of reliability for the entire form. This technique showed high reliability of the final version of the tool

The correlation coefficients were:

- $r = 0.869$ for knowledge

- $r = 0.915$ for practice

Pilot study:

The pilot study was carried out on 10% of subjects for testing the feasibility, applicability, and timeframe of the tools applications. The needed modification, omission and addition were made. Those who shared in the pilot study were included in the main study sample

Fieldwork:

After official permissions to carry out the study. This study was carried out through four consecutive phases: Preparatory phase & Planning phase, implementation phase and evaluation phase. The data collection period was extended from July 2018 till the end of December 2018. The previously mentioned settings were visited by the researchers two days/week Saturday and Thursday from 10.00 am to 2.00 pm.

The programs for elderly included the four phases:

1- Preparatory phase: The agreement for the participation of the subjects was taken after aims of the study have explained to the elderly they were given as an opportunity to refuse to participate. The investigators were reassuring the elderly that all the issues discussed confidential, used for research purpose only and for the sake of his loved one.

2- Planning phase: General objective of the program was to improve the elderly knowledge & practices as stated by them regarding the daytime. Determine learning the contents of the program regards sleep hygiene knowledge, caffeine, medication adherence, factors affect sleep, and quality of life. Additionally,

nutrition, exercise and sleep hygiene practices, the teaching methods used was discussion, role play, demonstration, pictures & using simple Arabic language. Educational media was used as a laptop and video.

3- Implementation phase: Through group discussion, the researcher discussed with the elderly the following:

1. The program was applied through (5) sessions two hours /week. The sessions were implemented every week in a special room in the pre-mentioned setting for a (30-45) minutes for each session over a period of two weeks and each session contained (10 -12 elderly). Then data were collected twice after 2 weeks posttest. Started with a summary of the previous session, and the objectives of the new one. The educational sessions lasted through 6 months.

2. The program covered the elderly knowledge regarding cognitive behavioral therapy, insomnia, sleep hygiene and elderly practices as do not smoke within several hours before bedtime, exercise regularly, but not within 2 hours of bedtime, make bedroom easier to sleep in and have a bedtime ritual, turn down the lights before bedtime, make sure bed is comfortable, and minimize noise, use earplugs if neighbors are noisy, if usually snack before bedtime, have a light carbohydrate snack with a small amount of fluid, such as milk, caffeine knowledge, awareness of food, beverages, or drugs that are disruptive to sleep & the practice covered how many nights per week they engage in activities that promote or inhibit sleep. Routine exercise (Scheduling exercise too close to bedtime), 30 minutes per day, 3 to 4 days a week can improve sleep duration, sleep onset latency, and quality of sleep.

4- Evaluation phase:

Evaluate the effect by using the pre/post phases of the cognitive behavioral therapy program on improving elderly knowledge, practices, factors that affect their sleep, and their quality of life.

Ethical consideration:

- An informed consent for participation in the study was taken verbally from elderly after full explanation of the aim of the study. They were informed that their participation in this study was voluntarily.
- The elderly persons were given the opportunity to refuse participation, and they were notified that they could withdraw at any stage of the data collection without giving any reason.
- The subjects were also assured that any information collected would be confidential and used for the research purpose only.

Statistical analysis:

Data entry and statistical analysis were done using SPSS 22.0 statistical software package. The collected data were organized, categorized, tabulated and analyzed. Data were presented in tables and charts using numbers and percentage, statistics and associations were done using mean, standard deviation SD, t-test and p-value. Significant of the result: no Significant if $p > 0.05$, Significant if $p < 0.05$ and Highly Significant if $p < 0.001$.

IV. Results

Table (1): Frequency distribution of elderly demographic characteristics data (No. = 80)

Items	No.	%
Age (years)		
• 60 - 69	46	57.5
• 70 - 79	30	37.5
• 80 +	4	5
Mean ± SD = 69.7±5.0		
Sex		
• Male	36	45
• Female	44	55
Marital status		
• Widow	63	78.75
• Married	7	8.75
• Divorced	10	12.5
Level of education		
• Illiterate	10	12.5
• Read & write	15	18.75
• Basic education	27	33.75
• University education	28	35

Residence		
• Rural	15	18.75
• Urban	65	81.25
Sources of income		
• Social affairs	26	32.5
• Revenue	20	25
• Pension	34	42.5
Income		
• Insufficient	25	31.25
• Sufficient	35	43.75
• Sufficient and save	20	25

Table (1), show that, (57.5%) of the elderly with insomnia were 60 – 69 years. The mean age of them was 69.7 ± 5.0 years, (55%) of the elderly were female. Also, (78.75%) of them were widows, (35%) of them were university education, and (81.25%) of them live in urban areas. Concerning source of income (42.5%) of them were pension, and (43.75%) of them had sufficient income.

Table (2): Distribution of elderly according to their medical history (No. = 80)

Items	No.	%
Current medications used		
• Anti-psychotics drugs	30	37.5
• Liver support	12	15
• Anti-hypertensive	40	50
• Anti-histaminic drugs	20	25
• Antacids	45	56.25
• Hypoglycemic drugs	35	43.75
• Analgesic	48	60
• Sleep medication	22	27.5
Follow up		
• Yes	50	62.5
• No	30	37.5
Problems during night sleep:		
• Cough	45	56.25
• Pain	51	63.75
• Nocturia	28	35
• Snoring	42	52.5
• Bad dreams	31	38.75
• Apnea	7	8.75

Table (2), illustrates that, (60%) of elderly were taking analgesic, (62.5%) of them done follow up and (63.75%) of elderly suffered from pain during night sleep.

Figure(1): Percentage distribution of the elderly according to their presence of chronic diseases (N=80).

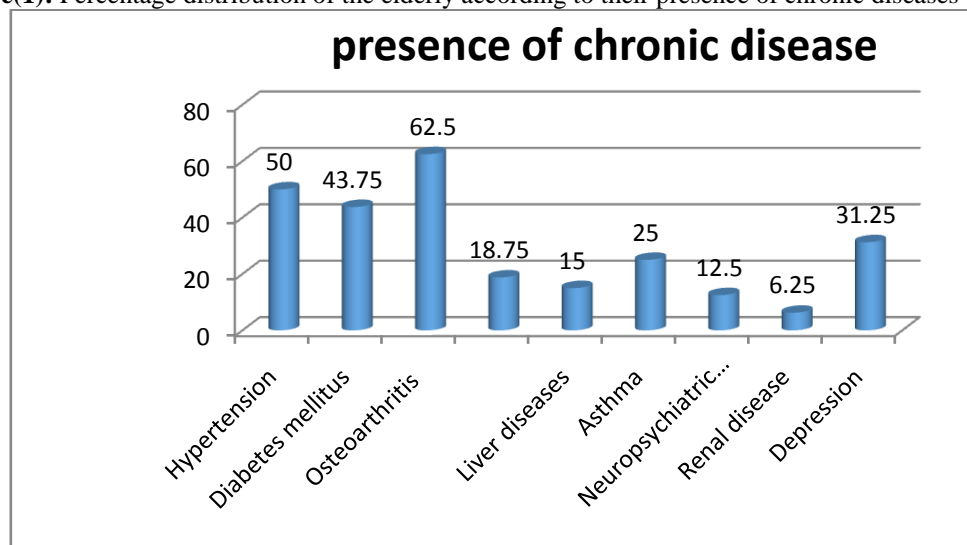


Figure (1), illustrates that, 62.5% of elderly had osteoarthritis, 50% of them had hypertension, and 43.75% of them had diabetes mellitus

Table (3):Environmental factors, and elderly habits before sleeping (N = 80).

Items	No.	%
Environmental factors:		
• Hot weather	20	25
• Another person in same room	50	62.5
• Noise	71	88.75
• Cold weather	15	18.75
• Uncomfortable bed	10	12.5
• Another person in same bed	3	3.65
• High lighting	19	23.75
• Flies	52	65
Habits done before bedtime:		
• Meal before bed time	32	40
• Drinking tea	40	50
• Smoking	30	37.5
• Drinking coffee	36	45
• Exercising before bedtime	4	5
• Drinking cola	25	31.25
Bad sleep habits:		
• Daytime long naps	39	48.75
• Irregular sleep time	60	75
• Use bed in other activities (TV, reading, etc.)	65	81.25
• Sleep medication	22	27.5
• Irregular waking up	50	62.5
• Irregular bedtime and rising time	45	56.25

Table (3), indicates that,(88.75% &65%)of the elderlywere complain noiseand flies ingeriatric homeenvironment respectively.Also, (50%&45%) of them were drinking tea andcoffee before bed time.About bad sleep habits (81.25% &75%) of them were use bed in other activities andirregular sleep time respectively.

Table(4):Frequency distribution of elderly's correct knowledge regardsCBT and insomnia preand post program (n = 80)

Items	Correct knowledge				X ²	P
	Pre(n=80))		Post (n=80)			
	N	%	N	%		
• Meaning of CBT	2	2.5	70	87.5	61.4	0.00
• Types of CBT	3	3.75	72	90	63.2	0.00
• Meaning of insomnia	25	31.25	65	81.75	55.2	0.00
• Causes of insomnia	15	18.75	70	87.5	58.3	0.001
• Sing& symptom of insomnia	22	27.5	71	88.75	61.4	0.00
• Diagnoses of insomnia	12	15	68	85	59.6	0.001
• Treatment of insomnia	13	16.25	75	93.5	62.5	0.00
• Prevention of insomnia	10	12.5	72	90	58.9	0.00

(X2): Chi-square test. P ≤ 0.050 (significant) P < 0.01(high significant)

Table(4), represents that, there was statistical significantimprovement of elderly correct knowledge regarding cognitive behavior therapy and insomnia inpost program than pre in all items at P <0.001.

Table(5): Frequency distribution ofelderlycorrect practicesregards insomnia preand post program (n = 80)

Items	Correct Practices				X ²	P
	Pre(n=80))		Post (n=80)			
	N	%	N	%		
Day timebehavior						
• Takeanap	50	62.5	10	12.5	78.6	0.002
• Smokemorethanonepack of cigarettes	30	37.5	7	8.75	58.7	0.021
• Takemedicationsfor sleep	22	27.5	2	2.5	61.2	0.143
• Exerciseactively within 2 hoursof before bed time	2	2.5	58	72.5	58.41	0.001
• Apply stress management techniques beforebedtime	2	2.5	69	83.75	72.45	0.000
• Regularbedtime andrisingtime	8	10	72	90	89.2	0.001
• Use bed in reading or watch TV	65	81.25	5	6.25	65.1	0.002

Drinks&Diet							
• Take meal before bed time	42	52.5	2	2.5	67.3	0.003	
• Drinking tea before bed time	50	62.5	0	0.0	78.5	0.000	
• Energydrinks before bed time	44	55	3	3.75	73.4	0.001	
• Warm drinks &Lemonade	10	12.5	76	95	57.6	0.000	
• Drinks containingcaffeine before bed time	45	56.25	0	0.0	58.9	0.001	
• Drinking cane(Cola,7-uporsprite,Pepsi) before bed time	49	61.25	1	1.25	63.2	0.001	
Environmentalfactors:							
• Low light in bedroom	5	6.25	73	91.25	79.4	0.000	
• Noise in bedroom	71	88.75	4	5	59.9	0.000	
• Flies in bedroom	52	65	6	7.5	68.45	0.001	
• Propertemperaturein bedroom	3	3.75	75	93.75	75.2	0.000	
• Comfortable mattressand pillow	30	37.5	76	95	53.6	0.012	

(X2): Chi-square test. P ≤ 0.050 (significant) P < 0.01(high significant)

Table(5), indicates that, there was statistically significant difference in elderly correct practices regards insomnia in post program than pre in all items (P < 0.001).

Table(6):Correlation between insomnia scale total score and elderly QOL (n=80).

Items	Insomnia (Spearman's rank correlation)
QOL domains:	
Physical Status	-.527**
Psychological Status	-.535**
Social Status	-.345**
Environment Status	-.607**

(**) Statistically significant at p < .01

Table (6), show that, there was correlation between QOL among elderly and insomnia in Spearman's rank correlation test indicates significant relationships between the elderly QOL and insomnia.

Table (7): Mean scores of elderly total quality of life pre and post program (n=80)

Total score of QOL	Pre Mean ± SD	Post Mean ± SD	P
High	30.14 ± 2.9	83.57 ± 7.88	0.00*
Moderate	54.88 ± 7.9	90.57 ± 6.98	0.00*
Low	89.57 ± 9.78	43.18 ± 5.9	0.001

P*: Paired-samples t-test *p < 0.05 (significant) ** P < 0.01 (high significant)

Table (7), shows that, there statistically significant difference in mean scores of elderly total quality of life in post program than pre. Also, elderly quality of life improved after applying insomnia cognitive behavioral therapy program (P < 0.001).

Table(8):Correlation between total mean score of elderly insomnia knowledge and practices and their QOL (n=80)

Items	Total mean score of insomnia knowledge		Total mean score of insomnia practice	
	R	P	R	P
QOL Score				
• Pre-program	0.178	0.127	0.100	0.395
• Post-program	0.473**	0.000	0.681**	0.00

***p < 0.05 (significant) ** P < 0.01 (high significant) R: Pearson's correlation coefficient.**

Table (8), indicates that, there was positive statistically significant correlation between elderly total mean score of insomnia knowledge and practices and their QOL in post program than pre at p < 0.00 and (R=0.473** & R=0.681**) respectively.

V. Discussion

Insomnia is highly prevalent, especially at advanced age. However, elderly people are in need a sleep of good quality in order to perform physical and psychological functions properly and to keep their quality of life at the optimum level. Sleep is a key indicator of quality of life. Therefore, changes that occur in sleep during the aging process affect quality of life negatively [22]. Insomnia is the most common sleeping disorder, associated

with a high societal cost. Although there are studies on different variables thought to be affecting quality of life and sleep among the elderly people; the number of the studies that investigate the relation between insomnia and quality of life is rather few. Human need sleep just like food and water. Elderly need 7-8 hours' sleep at night to have a normal physiologic function during the day^[23]. When people get elderly, they need less sleep than younger adults, as the elderly, in their 60s, need 30-60 minutes less than adults in their 20s^[24]. The quality of night sleep decreases with age and 30% of the elderly may experience chronic insomnia. Sleep hygiene means improving behavioral and environmental factors that meliorate sleep. A good sleep at night can promote daytime alertness^[25].

Part I: Sociodemographic characteristics data of the elderly, Medical history, Habits of elderly before sleeping, Environmental factors that affect sleeping, Knowledge about cognitive behavioral therapy and insomnia

Concerning the demographic characteristics of the studied elderly:

The present study revealed the range of age in the study subject was 60- 80 + years with mean 66.8 ± 5.0 years, more than half of them were females it may reflect a higher prevalence of sleep problems among women. These findings agreement with these results by Gureje, et al. (2011)[26] who study title "The natural history of insomnia in the Ibadan study of ageing," they found that was a higher proportion of female respondents though their study was community based and Globally, life expectancy is more favorable for women than men, 65.9 years for women as compared with 59.4 years for men.

Also agreement with Bloom, et al. (2011) [27], in a study titled " Assessment and management of sleep disorders in elderly persons" were held at the International Longevity Center (ILC-USA, New York), who reported that one possible contributing factor placing women at increased risk for sleep difficulties are changes related to menopause. In fact, sleep difficulty is one of the hallmark symptoms of menopause, with approximately 25-50% of women undergoing menopause reporting sleep complaints compared to approximately 15% of the general population.

Concerning marital status the results of the current sample showed most of studied elderly were widow and more than one third of them were university education. This results study agree with **Dollander (2014)**^[28], in study titled "Evaluating sleep quality and quality of life among elderly" who showed the significant relationship between marital status and sleep quality and quality of life, also concluded that education for the elderly and focusing on this issue has played a basic role in the reduction of the complaints over sleep disorders. These findings disagreement with **Gureje, et al. (2011)**^[26] in study title "The natural history of insomnia in the Ibadan study of ageing," who reported higher levels of insomnia in the married respondents.

As regard to income, current study refers to less than half of the studied elderly had sufficient income. These result disagree with **Leng et al. (2014)**^[29], titled in "Self-reported sleep patterns in a British population cohort in European Prospective Investigation of Cancer (EPIC)" who sleep problems being higher among elderly with low income and socioeconomic status.

Regarding medical history of the studied elderly revealed that the majority of them had chronic disease and the most common disease were osteoarthritis, hypertension taking analgesic, more than three quarters of them suffered from pain during night sleep. This result is agreement with **Bakr et al. (2011)**^[30] in study title "Prevalence of insomnia in elderly living in geriatric homes in Cairo, conducted in Egypt" who revealed that physical health problem as pain and nocturia were the factors associated with insomnia. From the researchers view elderly adults are more likely to develop more than one long-term health problems like chronic pain, cough, osteoarthritis that may disturb their sleep.

On the others hand this result is incongruent with **Fries et al., (2015)**^[31] in study titled "Insomnia and hypnotic use, recorded in the minimum data set, as predictors of falls and hip fractures in Michigan nursing homes" who reported that sleep difficulties were not related to aging itself but related to medical and psychiatric disorders and related health burdens and they observed the prevalence of main diseases in their study were hypertension 27.3%, arthritis 27%, diabetes 12.7%, and coronary artery disease 11.4%.

Regarding environmental factors & elderly habits before sleeping, the present study relieved that the majority of the elderly drinking tea and coffee before bed time and were use bed in other activities and irregular sleep time this finding was in the same line with **Lynda et al (2011)**^[32], who study title " Cognitive Behavioral Therapy for Insomnia in Elderly Adults" carrying out a study at National Institute of Mental Health and the Canadian Institutes for Health Research, they found that elderly people suffer from sleep disturbance due to taking stimulant substances such as caffeine or nicotine closely before bedtime.

Also this result agrees with a study done by **Buysse et al. (2011)**^[33] who study in titled "Efficacy of brief behavioral treatment for chronic insomnia in elderly adults in The University of Pittsburgh Biomedical

institutional" they found that elderly should avoid taking stimulant substances such as caffeine or nicotine closely before bedtime focus on the following instructions; they should get out of bed if unable to fall back to sleep at night, avoid all non-sleep activities such as reading, watching TV from the bedroom or while in bed. From the researchers point of view education on a convenient sleep environment like a quiet room environment, decrease light, and maintain a comfortable sleep temperature are lead to decreases sleep disturbance among elderly.

Hence the research hypothesis (H1) which stated that the insomnia cognitive behavioral therapy program will improve elderly knowledge & their practices regarding the daytime behavior and factors that affect sleep.

In relation to elderly knowledge the current study revealed that there was statistical significant improvement of elderly correct knowledge regarding cognitive behavior therapy and insomnia in post program than pre in all items at $P < 0.001$. These findings agreement with **Tamura, N. & Tanaka, H. (2017)**^[34] in studied titled "Effects of sleep management with self-help treatment for the Japanese elderly with chronic insomnia" a study conducted in Japan, who reported that educational intervention increased elderly patients' awareness of insomnia and consider the first-line for their treatment. Also one existing CBT knowledge test developed by **Bennett-Levy al. (2009)**^[35], who study in titled "Acquiring and refining CBT skills and competencies: which training methods are perceived to be most effective?" who reported that demonstrated sensitivity to change in CBT knowledge pre and post training program.

Part II: practices of elderly about insomnia

The current study showed that, there was significant difference in elderly correct practices regards insomnia in post program than pre as take a nap, take medications for sleep, exercise actively within 2 hours of before bed time, bedtime and rising time. These findings agreement with **Lindstrom et al. (2012)**^[36], who conducted a cross-sectional study on 242 elderly in Sweden to investigate the sleep parameters using the Pittsburgh Sleep Quality Index and sleep treatment option, they mentioned that participants gave incorrect answers to items related to taking a nap during daytime and the use of sleep medications, and they also erroneously believed that performing active exercise or engaging in emotionally upsetting activities close to bed time didn't disrupt sleep, and more than 60% of the elderly did not think that using the bed for purposes other than sleep induced a negative impact on sleep which concurred with the current findings.

Also, this results in the same line with **Fung, et al. (2016)**^[37] who study in Veterans Administration Greater Los Angeles Geriatric Research titled in "Efficacy of cognitive behavioral therapy for insomnia in elderly adults with occult sleep-disordered breathing", they reported that taking a nap has a negative effect on the quality of nocturnal sleep, and daytime sleepiness increased risk for cardiovascular morbidity.

Additionally, this result consistent with a study done by **Dogan, et al. (2015)**^[38] study conducted at the Cumhuriyet University Hospital in Turkey "Sleep quality in hospitalized patients" who observed that the main factors elders mentioned as being responsible for the interruption of their night sleep were environmental factors (for example, loud noises and excessive light disturbance, drinking tea before bed time and watch TV). In addition to these factors, among elderly, 44% referred to the noise caused by equipment placed near the bed, the noise caused by spouse who were generally in poor health or who were need to use the bathroom or the urinal. Excessive lighting was cited as an influential factor by 52%, and environment noises were cited by 36%.

Part III: Effect QOL among elderly

The current study presented that statistically significant difference in meanscores of elderly total quality of life in post program than pre and improved elderly quality of life after applying insomnia cognitive behavioral therapy program. These findings agreement with **Cheng & Dizon (2014)**^[39], in a study titled "Computerized cognitive behavioral therapy for insomnia" which conducted in Germany, who demonstrated that pre-post comparisons revealed a significant improvement in sleep quality of the studied elderly as measured by PSQI.

Also this result is congruent with **Waguhih et al., (2012)**^[40], in Hong Kong, study titled in "Quality of Life in Patients Suffering from Insomnia", they reported that individuals with insomnia reported poor QOL and individuals with insomnia reported more health concerns that limited physical activity, caused more body pain, and caused more emotional difficulties. Also, they explored the effect of insomnia on daytime functioning using the SF-36 to evaluate the QOL of three matched groups of 240 subjects with severe insomnia, 422 with mild insomnia, and 391 good sleepers. It was found that those with severe insomnia had lower QOL scores in the above eight dimensions of SF-36 than did those with mild insomnia and good sleep patterns. Mental status and emotional state were worse in both the severe and mild insomnia groups compared to the good sleepers.

In the current study indicated there was positive statistically significant correlation between elderly total mean score of insomnia knowledge and practices and their QOL in post program than pre. These findings are consistent with a study conducted in Australia by **Edward & Wang (2016)**^[41], who study title "Adequate sleep among adolescents in positively associated with health status and health – related behaviors" to examine

the relationships between sleep knowledge, sleep practice and PSQI Score in a sample of 946 participants with age ranging from 16 years old to 50 years and elderly. The results of this study showed that there was a significant association between sleep practice and PSQI Score. As well as, there was no significant relationship between sleep knowledge and PSQI score. From the investigators opinion CBT was effective treatment in reducing sleep onset latency and cognitive behavioral therapy was effective in improving the parameters and symptoms of insomnia.

Also demonstrated that cognitive behavioral therapy could effectively improve sleep onset latency and sleep efficiency in these elderly, and could effectively treat depression and anxiety symptoms.

VI. Conclusion

Based on the findings and research hypothesis of this study, it can be concluded that:

The insomnia cognitive behavioral therapy program had statistically significant improvement in elderly knowledge about insomnia and their practices regarding the daytime behavior and factors that affect sleep.

Also, after applying insomnia cognitive behavioral therapy program there was statistically significant improvement in elderly quality of life. There were statistically significant correlation between insomnia, and QOL among elderly.

VII. Recommendations

In light of the study findings, the following recommendations are proposed:

- Educational training programs about insomnia should be conducted at geriatrics homes and geriatrics outpatient clinics for elderly, to understand and know how to deal with insomnia as a chronic disease.
- Illustrated booklet should be available at all geriatrics homes and geriatrics outpatient hospital clinics and health centers for caring elderly suffering from insomnia and for elderly caregivers about insomnia.
- Periodical follow-up for the level of knowledge and practices of elderly quality of life.
- Simple educational pamphlets and posters about insomnia and quality of life should be provided for all elderly in geriatric homes and outpatient clinics.

Further studies are needed to:

- Determine what extent interventions to improve sleep can produce beneficial effects on QOL in the elderly.

References

- [1]. Alessi C., Vitiello MV. (2015): Insomnia (primary) in elderly people: Non-drug treatments. *BMJ ClinEvid*, 2302.
- [2]. Joiner, William J. (2016): "Unraveling the Evolutionary Determinants of Sleep". *Current Biology*. 26 (20): R1073–R1087. doi:10.1016/j.cub.08.068. PMC 5120870. PMID, 27780049.
- [3]. Almond KM et al. (2016): Insomnia and risk of dementia in elderly adults: Systematic review and meta-analysis. *J Psychiatr Res*, 77:109-15.
- [4]. Zucconi M, Ferri R. (2014): Assessment of sleep disorders and diagnostic procedures. *European Sleep Research Society* 5: 95-109.
- [5]. Silva AA, Mello RG, Schaan CW, Fuchs FD, Redline S, Fuchs SC. (2016): Sleep duration and mortality in the elderly: a systematic review with meta-analysis. *BMJ Open*.; 6:e008119. doi: 10.1136/bmjopen, 008119.
- [6]. Wickwire, E. M., Shaya, P. T., & Scharf, S. M. (2015): Health economics of insomnia treatments: The return on investment for a good night's sleep. *Sleep Medicine Reviews*, 72-82. doi:10.1016/j.smrv, 11.004
- [7]. Ellis JG, Perlis ML, Neale LF, Espie CA, Bastien CH. (2014): The natural history of insomnia: focus on prevalence and incidence of acute insomnia. *J Psychiatr Res*. Oct, 46(10):1278–1285. [PubMed: 22800714].
- [8]. Alessi C, Vitiello MV. (2015): Insomnia (primary) in elderly people: Non-drug treatments. *BMJ ClinEvid*, 2302.
- [9]. Gambhir IS, Chakrabarti SS, Sharma AR, Saran DP. (2017). Insomnia in the elderly. *J Clin Gerontol Geriatr*, 5: 40-47.
- [10]. Ho FY, Chung KF, Yeung WF, et al. (2015). Self-help cognitive-behavioral therapy for insomnia a: A meta-analysis of randomized controlled trials. *Sleep Med Rev*, 19:17–28. [PubMed: 25104471]
- [11]. Geiger-Brown JM, Rogers VE, Liu W, et al. (2014): Cognitive behavioral therapy in persons with comorbid insomnia: A meta-analysis. *Sleep Med Rev*. 23C:54–67.
- [12]. Maston, D. F., Bryson, J., & Corwyn, R. (2014): Assessment of sleep hygiene using the Sleep Hygiene Index. *Journal of Behavioral Medicine*, 29(3), 223-227.
- [13]. Van Straten A et al. (2017): Cognitive and behavioral therapies in the treatment of insomnia: A meta-analysis. *Sleep Med Rev*. S1087-0792(17):30034-5.
- [14]. Scalo J, P, Rascati K. (2015): Insomnia, hypnotic use, and health-related quality of life in a nationally representative sample. *Qual Life Res*, 24:1223-33.
- [15]. National Center on Sleep Disorders Research (NCSDDR) (2014): Sleep in medical conditions. National sleep disorders research plan. Available from: http://www.nhlbi.nih.gov/health/prof/sleep/res_plan/section4/section4e/html.
- [16]. Saber, A.D.M. *Insomnia among elderly in Alexandria* (2015): Master thesis, High Institute of Public Health, Alexandria University, Egypt.
- [17]. Stepanski, E. J., & Wyatt, J. K. (2013): Use of sleep hygiene in the treatment of insomnia. *Sleep Medicine Reviews*, 7(3), 215-225.
- [18]. Brown, F. C., Buboltz, W. C., & Soper, B. (2015). Development and evaluation of the sleep treatment and education program for students. *Journal of American College Health*, 54 (4), 231-237.

- [19]. **Lacks P, Powlisha K. (1989).** Improvement following behavioral treatment for insomnia: clinical significance, long term maintenance and predictors of outcome. *Behavior Therapy*, 20:117–134.
- [20]. **Soldatos, C.R., Dikeos, D.G., & Paparrigopoulos, T.J. (2003):** The diagnostic validity of the Athens Insomnia Scale. *Journal of Psychosomatic Research.*; 55(3): 263-267. [http://dx.doi.org/10.1016/S0022-3999\(02\)00604-9](http://dx.doi.org/10.1016/S0022-3999(02)00604-9)
- [21]. **Maes, I. H., Delespaul, P. A., Peters, M. L., White, M., P., Van Horn, Y., Schruers, K., & Joore, M. (2015).** Measuring health related quality of life by experiences; the experience sampling method. *Value in Health*, 18 (1), p.p. 44-51.
- [22]. **Tel, H. (2015): Sleep quality and quality of life among the elderly people.** *Neurology, Psychiatry and Brain Research*; 19(1): 48-52. Available at <http://dx.doi.org/10.1016/j.npbr.2012.10.002>
- [23]. **Ancoli B. & Israel S. (2015).** Insomnia in the elderly: a review for the primary care practitioner. *Sleep*; 23(Supple 1):S23–30.
- [24]. **Reid, K.J., Zoran, M., Sanford, F., Judy, S., Robyn, G., Kathryn, H., et al. (2014).** Sleep A Marker of Physical and Mental Health in the Elderly. *American Journal of Geriatric Psychiatry*. 14(10): 860-866. PMID:17001025 Available at <http://dx.doi.org/10.1097/01.JGP.0000206164.56404.ba>
- [25]. **Byles J.E., Mishra G.D., Harris M.A. (2015).** The experience of insomnia among elderly women. *Sleep*. Aug, 1:28(8):972-9.
- [26]. **Gureje, B. D. Oladeji, T. Abiona, V. Makanjuola, and O. Esan. (2011).** “The natural history of insomnia in the Ibadan study of ageing,” *Sleep*, vol. 34, no. 7, pp. 965–973.
- [27]. **Bloom H.G., Ahmed I., Alessi C.A., Ancoli-Israel S., Buysse D.J, Kryger M.H., Phillips B.A., F.C.C.P, Thorpy M.J, Vitiello M.V. and Zee P.C. (2011).** Evidence-based recommendations for the assessment and management of sleep disorders in elderly persons. *JAGS*, 57:761-789.
- [28]. **Dollander M. (2014).** Etiology of adult insomnia. *Encephale*. 28(6):493-502.
- [29]. **Leng Y., Wainwright N.W., Cappuccio F.P. (2014).** Self-reported sleep patterns in a British population cohort. *Sleep Med*, 15: 295–302.
- [30]. **Bakr IM, El-Ezz NFA, Abd-Elaziz KM, Khater MS, Fahim HI. (2011).** Prevalence of insomnia in elderly living in geriatric homes in Cairo. *Egyptian J Community Med*, 29: 53-65.
- [31]. **Fries B.E., James M.L., Szafara K.L., Wright G.T., & Chervin R.D. (2015).** Insomnia and hypnotic use, recorded in the minimum data set, as predictors of falls and hip fractures in Michigan nursing homes. *J Am Geriatr Soc*, 53(6):955–62.
- [32]. **Lynda Bélanger, Mélanie LeBlanc Charles, M. Morin et al. (2016).** Cognitive Behavioral Therapy for Insomnia in Elderly Adults Available online <https://www.sciencedirect.com/science/article/pii/S1077722911000502>
- [33]. **Buysse DJ, Germain A, Moul DE, et al. (2011).** Efficacy of brief behavioral treatment for chronic insomnia in elderly adults. *Arch Intern Med*, 171:887–895. [PubMed: 21263078]
- [34]. **Tamura, N., & Tanaka, H. (2017):** Effects of sleep management with self-help treatment for the Japanese elderly with chronic insomnia: a quasi-experimental study. *Journal of Behavioral Medicine*, 40(4), 659-668. doi:10.1007/s10865-017-9836-0
- [35]. **Bennett-Levy J, McManus F, Westling BE, Fennell M, (2009).** Acquiring and refining CBT skills and competencies: which training methods are perceived to be most effective? *Behav Cogn Psychother*. Oct, 37(5):571-83. [PubMed] [Ref list].
- [36]. **Lindstrom V., Andersson K., Lintrup M., Holst G., & Berglund J. (2012).** Prevalence of sleep problems and pain among the elderly in Sweden. *J Nutr Health Aging*, 16(2): 180-3.
- [37]. **Fung, C. H., Martin, J. L., Josephson, K., Fiorentino, L., Dzierzewski, J. M., Jouldjian, S, Alessi, C. (2016).** Efficacy of cognitive behavioral therapy for insomnia in elderly adults with occult sleep-disordered breathing. *Psychosomatic Medicine*, 78(5), 629-639.
- [38]. **Dogan O, Ertekin S, Dogan S. (2015).** Sleep quality in hospitalized patients. *J Clin Nurs*, 14(1):107-13.
- [39]. **Cheng S.K., & Dizon J. (2014).** Computerized cognitive behavioral therapy for insomnia: a systematic review and metaanalysis. *Psychother Psychosom*, 81(4):206-16.
- [40]. **Waguih W. Ishak, Md, Fapa, Kara Bagot, Md; Shannon Thomas; Naira Magakian, et al. (2012).** Quality of Life in Patients Suffering from Insomnia. *Innov Clin Neurosci*, 9(10):13–26
- [41]. **Edward K., Wang Y. (2016).** Adequate sleep among adolescents in positively associated with health status and health – relate behaviors. *BMC Public Health*, 6:59.

Sahar Mahmoud Sayed Ahmed El Awady " A Study to Assess the Effectiveness of Progressive Muscle Relaxation Therapy on Stress among Staff Nurses Working in Critical Care Unit In Selected Hospitals at Varanasi city " .IOSR Journal of Nursing and Health Science (IOSR-JNHS), vol. 8, no.05 , 2019, pp. 80-91.