Relationship between Night Sleep and Day Time Sleepiness, Activities of Daily Living, and Cognitive Status of Community Dwelling Elders

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Abstract

Sleep disorders are commonly under diagnosed and are a significant source of concern in the geriatric population. Because of the high prevalence, complexity, and health implications associated with sleep-related disorders in older individuals, increasing attention is now being focused on this topic. **Aim:** The aim of this study is to identify the relationship between night sleep and day time sleepiness, activities of daily living, and cognitive status of community dwelling elders. **Setting:** The study was carried out in the medical outpatient clinics in The South Valley Main University Hospital at Qena city. **Subjects:** The study included, one hundred older adults aged 60 years and above, able to communicate effectively, and accept to participate in the study **Tools:** five tools were used in this study; the socio-demographic and clinical data structured interview schedule, Short Portable Mental Status Questionnaire (SPMSQ), The Katz Activities of Daily Living (ADL) Scale, The Epworth Sleepiness Scale (ESS), and Functional Outcomes of Sleep Questionnaire. **Results:** A statistically significant difference was observed between elders' social characteristics outcome and excessive daytime Sleepiness of the studied elders. More than half of a very sleepy studied elders reported poor productivity, poor social outcome, poor activity levels, and poor vigilance. Around two thirds of the poor functional outcome' studied elders were dependent in ADLs, and had mild - moderate cognitive impairment. **Conclusion:** positive relationships were found between poor functional outcomes of sleep subscales (poor productivity, poor social outcome, poor activity levels, and poor vigilance) and the older adults' dependency in performing A DL. Sever cognitive impairment, and very sleepy older adults, that should seek medical advice. **Recommendations:** Preparation of an instructional booklet to include tips to improve sleep pattern, importance of stick to a regular bedtime, sleep hygiene practice, and healthy life style. Taking into consideration criteria of written materials for the elders should be considered.

Key words: elders, sleep, activities of daily living, cognitive status, nurses' role.

Introduction

The Sleep plays a vital role in good health and well-being throughout one's life. Getting enough quality sleep can have a significant impact on daily functioning, alertness, mental and physical health, safety, and overall quality of life. Most people have experienced sleeping problems at one time or another (**Campbell et al, 2005; Jacobs et al, 2006**). Sleep disturbance are common and affect negatively their health conditions and

quality of life particularly among older adults. It is the third most common elders' complaint, ranking behind headache and common cold (**Mahowald & Bornemann, 2007**). Poor sleep quality has a negative effect on the person's overall health. Several studies have demonstrated that sleep problems may lead to substantially impaired health, decreased elder's energy level, emotional balance, decreasing memory and concentration, increased risk of falls, cognitive decline, higher rate of mortality, and increased health service utilization and increased medical expenditure (**Campbell et al, 2005; Ancoli-Israel & Cooke, 2005**).

Many older adults report being less satisfied with night sleep which make them feel more tired and fatigued during the day. Disturbed night sleep is affected by daytime sleepiness, naps which usually increase with age. In addition to the presence of health problems and the use of medication which are common with aging. The prevalence of sleep problems also tends to increase with age (**Kamel & Gammack 2006**). Approximately 15% of older adults in United States have insomnia of significant severity to seek medical attention. Of the US population, 1.7% receives a hypnotic prescription annually, and another 0.8% purchase nonprescription sleep aids (**Taylor et al 2005**). In Brazil, a study reported higher prevalence of sleep problems to be 32 % (**Aragao et al, 2004**). Another study in Japan revealed a high prevalence of insomnia to be 62.7% among acute ward inpatients (**Enomoto et al, 2010**). In Egypt, in Alexandria (2013) a study reported that 33.4% of elderly people experienced insomnia (**Saber A, 2013**). Other studies done in Cairo 2012 and Zagazig 2014-Egypt, found that the prevalence of insomnia among older people were 36.4%, and 33.6% respectively (**Bakr et al, 2012; Abd Allah et al, 2014**).

Sleep problems are usually under-diagnosed and are significant source of concern in the geriatric population (**Subramanian & Surani, 2007**). Several diverse factors may contribute to sleep problems among increased elderly persons. These include retirement, health problems, death of spouse/family members, and changes in circadian rhythm (**Avidan et al, 2005**). Changes in sleep patterns may be part of the normal aging process; however, many of these disturbances may be related to pathological processes that are not considered a normal part of aging (**Mahowald & Bornemann, 2007**). In addition to affecting quality of life because of excessive daytime sleepiness, as well as physical, psychological, and cognitive problems, sleep disorders have been implicated with increased mortality (**Fu Y et al, 2016**). In addition, elders suffer from co-morbidities that require treatment which in turn may lead to sleep disturbances with its consequences, also number of medications used, which in itself can lead to increased morbidity, mortality, and side effects such as falls (**Latimer Hill et al, 2007**).

Sleep among older adults may be characterized by repeated nocturnal arousals and awakening, resulting in reduced total sleep time and efficiency, daytime sleepiness and napping (**Ancoli-Israel & Cooke, 2005**). Studies on the sleep habits of older adults showed an increase in time taken to fall asleep (sleep latency), an overall decline in rapid eye movement(REM) sleep, and an increase in sleep fragmentation (waking up during the night) with age (**Blay et al, 2008; Zilli et al,2009**) . Aging modifies sleep-wake rhythms which results in a diminished nocturnal sleep resulting from frequent naps during the day (**Jacobs et al, 2006**). Among the elderly people, it may be difficult to distinguish physiological early afternoon naps and excessive daytime sleepiness. Excessive daytime sleepiness (EDS) is an extremely common problem, especially in elderly people, that is associated with reduced alertness, impaired cognitive function, falls and an increased cardiovascular morbidity, increased

dependence, and mortality rate (**Hayley et al, 2014**). Moreover, EDS can lead to poor occupational and social functioning (**Bittencourt et al, 2005**). Despite these adverse effects of EDS, the accurate representations of the burden of EDS among Egyptian elderly are unclear. Causes of EDS are multifaceted, with various risk factors. It often occurs because of severe sleep-disordered breathing, subjective poor sleep quality, increased rapid eye movement, pain, and use of sedating medications (**Pack et al, 2006; Empana et al, 2009**). Risk factors for EDS are nighttime awakening, depression, snoring, non-use of sleeping pills, and limitations in mobility. While several population-based studies of EDS in elderly people have been conducted in other countries (**Beland et al, 2011; Kaneita et al, 2005**) .yet; no study has evaluated EDS in older adults in Egypt.

Cognitive impairment and psychiatric illnesses are often associated with sleep disturbance, as for elderly patients with major depressive disorders, 50% report substantial sleep impairment. It is well established that sleep deprivation affects cognitive performance and this is not only true for acute total sleep deprivation, but also for chronic and partial sleep loss. Among the cognitive domains that are simultaneously most affected by poor sleep or sleep loss and most important for ADLs, are attention, memory and executive functions. Accumulating evidence suggests that sleep is pivotal for memory consolidation, maintaining attention and the ability to concentrate, and it seems to stabilize and enhance various types of memories (**Wong et al, 2016**).

Gerontological nurses should be aware that most elders fail to even report the symptom of EDS to physicians, either because of a lack of recognition that the symptom is medically significant, or their belief that it is a consequence of aging, or a concern that it may be interpreted

pejoratively as a sign of laziness or even senility (**Mahowald & Bornemann, 2007**). Even when the patient does register the complaint, however, physicians are unlikely to obtain a sleep history and are even less likely to attempt to assess the problem (**Enomoto et al, 2010**). So, Gerontological nurses play an important role when elderly person experiences significant EDS. Through assessing and evaluating his condition. This includes a medical history review, concomitant medications, physical examination, laboratory work, and a Mental Status Examination. If the provider is unable to determine the underlying causality of the sleep disturbance, referral to a psychiatrist or sleep specialist may be necessary. At this point, a more in-depth examination is performed to rule out other potential contributing factors and to reach a diagnosis (**Avidan et al, 2005**). Determining the causality of the sleep disturbance is imperative for nurses to be able to educate elders and caregivers about treatment alternatives. Treating EDS in the elderly can improve overall health, but care must be taken when medications are used in this particular population. Elderly people are in need of a good quality sleep in order to perform properly daily living functions and to keep their quality of life at the optimum level (**Fu Y et al, 2016**).

Although there are studies on different variables thought to be affecting sleep among the older adults; the number of the studies that investigate night sleep and its relation with daily lives among Egyptian elders is rather few. So, this study was conducted to determine the relationship between night sleep and day time sleepiness, activities of daily living, and cognitive status of community dwelling elders.

Aim of The Study

The aim of this study is to identify the relationship between night sleep and day time sleepiness, activities of daily living, and

cognitive status of community dwelling elders.

Research question

What is the relationship between night sleep and day time sleepiness, performing activities of daily living, and cognitive status of community dwelling elders?

Materials and Method

Materials

Study Design:

The study followed a descriptive Correlational design.

Setting

The study was carried out in the outpatient clinics in The South Valley Main University Hospital in Qena city, Egypt. (Outpatient medical clinic, outpatient diabetic clinic, outpatient chest clinic, and outpatient cardiology clinic).

Subjects:

The study comprised 100 older adults of those attending the previous setting and fulfilling the following criteria, aged 60 years and above, male or female, able to communicate effectively, accept to participate in the study, and attending the previous settings during the time of data collection.

Tools of data collection:

Tool (I): Older adults' Socio – demographic and Clinical data Structured interview schedule:

It was developed by the researchers based on relevant literature to collect information from the study subjects about socio-demographic data, medical problems, and medications used. As well as information about the elders night sleeping pattern which include: usual time of going to bed, activities prior bed time, day time sleepiness , naps, difficulty to fall asleep, feeling comfort at morning, and behavior on awakening.

Tool (II): Short Portable Mental Status Questionnaire (SPMSQ):

This tool was developed by **Pfeiffer E (1975)**. It is used for rapid screening of cognitive deficit in institution and community dwelling elderly people. It includes ten simple questions that cover short and long term memory, orientation to surroundings, knowledge of the current events, and ability to perform mathematical tasks. The scoring of SPMSQ is as follows: Each elder was asked to respond to 10 statements, the total number of errors based on the answers to the 10 questions recorded. The total SPMSQ score ranged from 0 to 10 points, it was divided into five levels according to the following; 0 -2 errors: Normal mental functioning, 3-4 errors: Mild cognitive impairment, 5-7 errors: Moderate cognitive impairment, and 8 or more errors: Severe cognitive impairment (The higher number of errors means the more deteriorated cognitive function). SPMSQ was translated into Arabic and approved to be valid and reliable(r = 0.89) by **Abd El Salam (2012).** The Arabic version of this questionnaire was used in this study.

Tool (III): The Katz Activities of Daily Living (ADL) Scale:

The ADL scale is an instrument to assess independent living skills developed by **Katz et al (1970).** It assesses the elder's activities of daily living namely, grooming, toileting, eating, dressing, bathing, and mobility. These activities were measured and scored according to the individual's actual performance as follow: Each elder was asked to respond to 6 statements describing the ADLs by using a 3- point Likert self-rating

scale which ranged from (1) unable to do to for those who perform the activity with supervision, direction, personal assistance or total care, (2) for those who perform the activity with minimal or partial supervision, direction or personal assistance and (3) for those who perform the activity with no supervision, direction or personal assistance. The total Katz score ranged from 1 to 18 points, it was divided into three levels according to the following; low function, dependent (1 to 6), partially dependent (7 to 12), high function, independent (13 to 18). Katz Activities of Daily Living Scale was translated into Arabic and approved to be valid and reliable by **Melis & ElShazly (1999).** The Arabic version of this scale was used in this study.

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

This scale was developed by Johns (1991). It is a valid instrument used to measure excessive daytime sleepiness. The ESS differentiates between average sleep and significant issues with sleepiness that requires intervention. The subject self-rates on how likely it is that he / she would doze in eight different situations. Scoring of the answers is ranged from 0-3, with 0 being "Would never doze" and 3 being "high chance of dozing" The total score ranged from 0 to 24 points it was divided into the following categories; a sum of 0-7 (abnormally sleepy). 8 - 9 (an average amount of daytime sleepiness). 10-15 (excessively sleepy depending on the situation consider seeking medical advice) and 16-24 (excessively sleepy and should consider seeking medical advice). The Epworth Sleepiness Scale was translated into Arabic and approved to be valid and reliable (r= 0.75) by **Maximos & Fouad (2007)**. The Arabic version of this scale was used in this study.

Tool (V): Functional Outcomes of Sleep Questionnaire:

It was developed by **Weaver et al. (1997),** and used to evaluate the impact of disorders of excessive sleepiness on activities of daily living. Each elderly was asked to rate the difficulty of performing a given activity as "no difficulty" or "difficulty" by using a 4-point Likert self-rating scale which ranged from 1 (extremely difficult), 2 (moderate difficulty), 3 (little difficulty) and 4 (No difficulty), then the potential rang of score is 1to 4, where low scores indicated greater dysfunction. The FOSQ was divided into 4 subcategories which are; general productivity (includes 8 questions), vigilance (includes 7 questions), activity level (includes 9 questions), and social outcomes (includes 2 questions). The Functional Outcomes of Sleep Questionnaire was translated into Arabic and approved to be valid and reliable (r= 0.92) by **Maximos & Fouad (2007).** The Arabic version of this questionnaire was used in this study.

Ethical considerations:

An informed consent was taken verbally from the study subjects to participate in the study after full explanation of the study purpose. Confidentiality of the collected data, privacy and anonymity of the study subjects and the right to withdraw at any time was assured. The study protocol and tools were approved by the Faculty Ethical Committee.

Method

- An official letter was issued from the Faculty of Nursing, South Valley University to the manager of the South Valley Main University Hospital, to obtain his approval for data collection from the outpatient clinics of the hospital.

- Permission from the head of the outpatient clinics was obtained, who

was informed about the purpose of the study and the date and time of data collection.

- Tool I was developed by the researchers based on relevant literature. The Arabic version of tool II, III, IV, and V were used in this study

- A pilot study was carried out on 10 older adults selected from the outpatient clinics in the Main University hospital of South Valley to test clarity, feasibility and the applicability of the tools.

- After explanation of the purpose of the study for each older adult who fulfills the study criteria, and obtained an informed consent for the participation in the study, data were collected by the researchers through face to face interview with the study subjects, following the designed schedule for data collection (tool I, II, III, IV, and V). The researchers used to start data collection at 9 Am all week days (from Saturday through Thursday).

- Each interview lasted for 45-60 minutes providing giving a break for the study older adults if required. It was possible to interview from 3-4 older adults daily. The data collection started from the beginning of January till the end of April 2016.

Statistical Analysis

The collected data were coded and analyzed using PC with the Statistical Package for Social Sciences (SPSS version 20) and tabulated frequency and percentages were calculated. The level of significance selected for this study was p value equal to or less than 0.05. The used tests were Chi-square test and Fisher's Exact or Monte Carlo test.

Results

Table (1) represents the relation between socio-demographic characteristics of the study elders and their daytime sleepiness. The results indicated that 80 % of studied subjects were aged 60 to less than 75years. 78.3% had average amount of day time sleepiness, followed by 75% very sleepy. The results also indicated that 56.0% of studied subjects were males. 41.7% were very sleepy. No Statistically significant relationships were noted between age, sex, level of education, and marital status and the elders' day time sleepiness (0.342, 0.091, 0.535, and 0.230 respectively). A statistically significant relationship was proved only between it and the elders' occupation before retirement (0.002)

Table (2) illustrates relation between the day time sleepiness of community dwelling elders and their cognitive status. It was found that the majority of the studied elders who had mild- moderate (67.5%) and / or severe (52.9%) cognitive impairments were reported, "getting enough sleep". No statistical significant relationship was detected between them (0.174).

Table (3) shows relation between Functional Outcomes of Sleep of community dwelling elders and their day time sleepiness. It was found that, 65% of the studied elders reported poor functional outcome of sleep; 64.6% of them getting enough sleep, followed by 41.7% very sleepy, with no statistically significant difference was noted (0.282). Regarding Functional Outcomes of Sleep Subcategory, the same table illustrated that, more than half of a very sleepy studied elders reported poor productivity 75%, poor social outcome 58.3%, poor activity levels 66.7%, and poor vigilance 66.7%. A statistically significant difference was observed between social outcome and Epworth Sleepiness Scale score of the studied elders (0.032).

Table (4) shows relation between Functional Outcomes of Sleep of community dwelling elders and their independence in performing activities of daily living. The table revealed that 65% of the studied elders reported poor functional outcome of sleep; 73.3% of them were dependent in ADLs with a statistically significant difference was noted (0.049). Regarding Functional Outcomes of Sleep Subcategory, the same table revealed that, the majority (53.3%) of dependent studied elders reported poor productivity, poor social outcome 55.6%, poor activity levels 51.1%, and poor vigilance 57.8%. A statistically significant difference were observed (0.024, 0.014) between activity levels, vigilance and ADLs of the studied elders.

Table (5) shows relation between Functional Outcomes of Sleep of community dwelling elders and their cognitive status. The table revealed that 65% of the studied elders reported poor functional outcome of sleep; more than two thirds (69.9%) of them had mild - moderate cognitive impairment with a statistically significant difference was noted (0.019). Regarding Functional Outcomes of Sleep Subcategory, the same table revealed that, the majority of severe cognitive impairment studied elders reported poor productivity, poor social outcome, poor activity levels, and poor vigilance (76.5%, 70.6%, 76.5%, and 58.8% respectively). A statistically significant difference were observed (0.027, 0.046) between general productivity, social outcome and cognitive status of the studied elders.

Figure (1) shows the relation between duration of daytime sleepiness of community dwelling elders and their nighttime sleep. It was found that, 44.4% of the study subjects sleep from 1 to 2 hours during the day time reported that they sleep less than 6 hours / night, 22.2% sleep more than two hours during the day time and they sleep less than 6 hours/ night. On the other hand, a small percent (8.7%) of the study subjects who

sleep more than 2 hours during the day time and they sleep more than 6 hours/ night, with a statistically significant difference (p = 0.004).

Table (6) shows relation between Sleeping Pattern of community dwelling elders and their Functional Outcomes of Sleep, independence in performing activities of daily Living, cognitive status, and day time Sleepiness. The table revealed that 65.7%, 54.5% of the studied who had good functional outcome of sleep and independent in ADLs respectively reported their general state of sleep as good, with statistically significant differences (0.003, 0.027respectively). Regarding duration of day time sleep, more than one quarter (27.7%) of the studied elders who had bad functional outcome of sleep and 228.9% of dependent elders reported that spent 2 hours and more to fall asleep with a statistically significant difference (0.037, 0.012 respectively).All the studied elders reported that they woke up during the night, the majority (98.5%) of the studied elders who had poor functional outcome reported that they found difficulty to sleep again when waking up during the night.

The same table revealed that, 92.3% of poor functional outcome of sleep, 76.5% of severe cognitive impairment elders, and 50% of very sleepy elders reported that they do not feel comfortable when waking-up in the morning, no statistically significant difference were found between cognitive status and the day time sleepiness of the studied elders and their feeling comfort at morning (0.189, 0.098 respectively).

Discussion

Sleep plays an important role in successful aging, as it decreases morbidity and mortality. Adequate sleep promotes good health, functional ability, and cognitive status. Poor sleep quality may contribute to decreased energy and motivation for the

performance of every day physical and social activities, self-care responsibilities, and affect the different domains of the quality of life, which may jeopardize function and independence in this population (**Mauk K, 2014**). In order to effectively manage sleep related problems among older adults, it is highly important to understand the relationship between sleeping and other variables affecting older adults well-being as sleep has an impact on the physical, psychosocial, spiritual, economic, social, and spiritual well-being of older adults (**World Health Organization, 2014**), so the current study aimed to identify the relationship between night sleep and day time sleepiness, activities of daily living, and cognitive status of community dwelling elders.

The results of the current study indicated that the majority of studied subjects were young old (60 to less than 75years) of them, more than three quarters had average amount of day time sleepiness, followed by very sleepy. **Hong Kong (2013),** reported that there was a significant relation between age and sleep disturbance (**Onen et al, 2013). Moreover, Rao V et al, (2005)** declared in their study that more than two thirds of assisted living facilities residents reported sleep disturbance, primarily insomnia and daytime sleepiness. This contradiction in findings may be due to the different age categories younger and older, and the differences in methods and tools used in each study.

Several studies have reported gender differences regarding the presence of EDS, with positive associations between EDS and male gender. In the present study, a higher rate of EDS in females was found. This finding is supported by another study done in Canada (**Rockwood et al, 2001**). These dissimilarities could reflect methodological differences between studies. Furthermore, there has been no clear evidence for pathophysiological mechanisms underlying gender difference in EDS.

No statistically significant difference was noted between functional outcome of sleep of the study subjects and their day time sleepiness. **Gooneratne et al, (2003)** reported that daytime sleepiness as measured by the ESS was moderately correlated with the functional outcome scale questionnaire (FOSQ) total score.

The FOSQ determines whether the person have difficulty in performing specific activities due to sleepiness or tiredness. The FOSQ was divided into 5 subscales which are general productivity, social outcome, activity levels, vigilance, and sexual relationship (**Rahavi-Ezabadi et al, 2016**). In the current study the fifth subscale was not assessed as it is culturally sensitive issue that not easily discussed with older population; the rest of subscales indicate that three quarters of a very sleepy studied elders reported poor productivity, and around two thirds reported poor activity levels. In the current study there is a statistically significant difference was observed between social outcome of the study subjects and their day time sleepiness. In general, daytime sleepiness is associated with functional impairments in a broad range of activities. The decrease in daily functioning noted in the sleepy older adults is associated with quantifiable limitations in the activities performed by them, inability to maintain alertness or vigilance, and decrease cognitive functioning.

One of the primary consequences of sleepiness are its effect on the activity of daily living (ADLs), the current study findings revealed that around three quarters of the study elders were dependent in performing ADLs. A statistically significant difference was noted between functional outcomes of sleep and independence in performing activities of daily living. Moreover, more than half of dependent studied elders reported poor productivity, poor social outcome, poor activity levels, and poor vigilance. Statistically significant

differences were observed between activity levels, vigilance and ADLs of the studied elders. These findings are in the same line with what were reported by **Altiok et al, (2012).**

There is a growing body of evidence postulating relationships between sleep and cognitive abilities. Researches into sleep restriction in humans found that sleeping 6 hours or less per night produced cognitive performance deficits (**Jauhar S, 2010). Furthermore, Rasch & Born, (2013),** and **Bruce & Aloia, (2006)** confirmed the positive effect of sleep on memory and cognition. The current study assessed the cognitive function and its relation to sleeping disturbance among elders, and found that more than two thirds of the study elders had mild to moderate cognitive impairment with a statistically significant difference between cognitive function and functional outcomes of sleep, and the majority of elders with severe cognitive impairment reported poor productivity, poor social outcome, poor activity levels, and poor vigilance. Statistically significant differences were observed between general productivity, social outcome and cognitive status of the studied elders. These findings were expected hence functional outcome of sleep affects cognitive functions, as enough sleep time and relaxation affects person's health physically and psychologically as well as mentally. Person who receive adequate period of rest and sleep will have better performance and better quality of life, the findings of the present study can be considered in light of two separate bodies of researches. The first has to ascertain that cognitive brittleness among Chinese older adults is directly related to sleep disturbance (**Liu and Liu, 2005**). The second study of **Martin et al, (2008)** reported that there is potential impact of sleep on mental and physical well-being in older people in general that leads to functional decline among older people in assisted living facilities.

Literature revealed that one of the important parameters for good health and fitness is the ability to perform physical activity. In relation between physical activity and sleep, the result of the present study revealed a positive relation between them, as three quarters and one half of the partially dependent elders reported poor sleep, and poor activity level respectively. Studies done in Brazil (**Guimaraea et al, 2008**), and France (**Atkinson et al, 2012**) stated that physical activity has direct positive effects on sleep of elderly persons.

Older adults need to sleep from 6 to 8 hours per day. The result of the present study revealed that more than two fifth of the study elders sleep at night less than 6 hours, this may be due to difficulty to fall asleep which reported by the majority of the study subjects and frequent wakening (table 6). These findings are in agreement with the studies carried out in Egypt and Japan (**Makhlouf et al, 2007; Yokoyama et al 2008).**

The majority of the study subjects reported being uncomfortable on awakening, as consequences of sleep disturbance and deprivation, in addition to poor quality of sleep. The same result was reported by other studies (**Hjelm C, 2013; Raymann R, 2013**). A study for sleep quality of elders living in long-term care institutions at **São Paulo, 2010** showed that the majority of the studied elders reported their sleep quality was good or very good. Nevertheless, there was an elevated frequency of sleep related problems such as: getting up to go to the bathroom; getting up in the middle of the night or very early in the morning; feeling too hot; feeling pain. Furthermore, **Galea M, (2008)** added that around one third of participants self-reported good sleepers, and the rest self-reported poor sleepers with nearly one third using benzodiazepine hypnotic medication regularly, and the findings suggested that while they self-classified good sleepers they had lower anxiety levels. These results support the current study findings, where

more than half of the studied who had good functional outcome of sleep and independent in ADLs reported that their general state of sleep is good, with statistically significant differences. These findings show an evident contradiction between elders' perception of their sleep quality and the actual elevated number of identified sleep problems since more than one quarter of the studied elders who had bad functional outcome of sleep they reported that they spent 2 hours and more to fall asleep with a statistically significant difference. Additionally, all the studied elders reported that they woke up during the night, the majority of the studied elders who had poor functional outcome reported that they found difficulty to sleep again when waking up during the night. These findings were in line with **Fung et al' results (2012).**

The current study revealed that, the majority of poor functional outcome of sleep, three quarters of severe cognitive impairment elders, and half of very sleepy elders reported that they do not feel comfortable when waking up in the morning. These findings are logically acceptable since sleeplessness will disturb the individual and act as a barrier to feel relax. Importance of these findings is that sleep duration and quality are important factors in the daytime functioning of older adults, and may be important targets for intervention to improve quality of life. Relaxation techniques will help the older to exhibit comfort throughout the day thus will improve the daytime functions. Moreover, **Yu-Ping & Davina, (2015)** suggested that interventions to engage nursing home residents in more social activities during the day may be beneficial to minimize their daytime sleepiness, especially for those who have difficulties with engaging socially on their own. This will decrease sleep disturbance and help elders to feel more comfort the same results were approved by **Goldman S, (2006);** and **Leblanc et al, (2015).** Nursing care for community dwelling elders suffering from sleep deprivation or

sleeping problems is a crucial activity that must be tailored for each elder separately based on accurate and detailed assessment. In this regards Community and Gerontological nurse and other health team must collaborate to improve sleep among older population.

Conclusion and Recommendations

From the findings of the present study, it can be concluded that, although sleep disturbance is a chronic health problem common in older adult, it remains a neglected problem for those who are afflicted and those who provide care for them. One may conclude that, positive relations were found between poor functional outcomes of sleep subscales (poor productivity, poor social outcome, poor activity levels, and poor vigilance) and the older adults' dependency in performing ADL. Severe cognitive impairment, and very sleepy older adults, should seek medical advice.

The following are the main recommendations yielded by this study:

1. Educational programs should be conducted by nursing faculty members to elders and their care givers focusing on the necessary awareness of age-related changes which may affect their sleep, cognitive function, and ADL, and measures to enhance sleep, self- care capabilities, and improve cognitive functions in old age.

2. Nursing faculty members should give health instructions to elders with sleep disorder on how to improve their sleeping pattern and quality of life, with more efforts to improve the awareness of the elderly regarding the importance of good sleep and avoidance the risk factors of insomnia through posters, and pamphlets.

3. Preparation of an instructional booklet to include tips to improve sleep pattern,

importance of stick to a regular bedtime, sleep hygiene practice, and healthy life style. Taking into consideration criteria of written materials for the elders should be considered.

4. Further researches are needed to clarify the consequences of sleep disorders on the quality of life of older adults in the community and / or elderly homes, and to determine to what extent interventions to improve sleep can produce beneficial effects on.

Table (1): Relationship between socio-demographic characteristics of the study elders and their daytime sleepiness.

Socio-demographic characteristics	The Epworth Sleepiness Scale								Test of Significance
	Getting enough sleep		Average hours of sleep		Very sleepy		Total (n = 100)		
	N= 65	%	N= 23	%	N =12	%			
Age (years)									
60-	53	81.5	18	78.3	9	75.0	80	80	FET =0.324 P = 0.342
75 +	12	18.5	5	21.7	3	25.0	20	20	
Sex									
Male	40	61.5	11	47.8	5	41.7	56	56	FET = 2.455 P = 0.091
Female	25	38.5	12	52.2	7	58.3	44	44	
Level of education									
Illiterate	14	21.5	6	26.1	2	16.7	22	22	FET = 7.390 P = 0.535
Read and write	13	20	6	26.1	2	16.7	21	21	
Primary	17	26.2	4	17.4	2	16.7	23	23	
Preparatory	3	4.6	2	8.7	3	25	8	8	
Secondary	3	4.6	2	8.7	1	8.3	6	6	
University	15	23.1	3	13	2	16.7	20	20	
Marital status									
Married	36	55.4	9	39.1	7	58.3	52	52	FET =4.554 P = 0.230
Widow	26	40	14	60.9	5	41.7	45	45	
Single	2	3.1	0	0	0	0	2	2	
Divorced	1	1.5	0	0	0	0	1	1	
Occupation before retirement									
Skilled work	32	49.2	9	13	0	0.0	35	35	FET = 24.715 P = 0.002*
Employee	18	27.7	5	21.7	6	50	29	29	
House wife	14	21.5	13	56.5	5	41.7	32	32	
Free-work	1	1.5	2	8.7	1	8.3	4	4	

* Significant value at P<0.05

Table (2): Relation between excessive daytime sleepiness of community dwelling elders and their cognitive status

The Epworth Sleepiness Scale	Cognitive status						Test of Significance
	Mild–Moderate cognitive impairment		Severe cognitive impairment		Total (n = 100)		
	N (83)	%	N (17)	%	N(100)	%	
Getting enough sleep	56	67.5	9	52.9	65	65	FET = 1.369
Average hours of sleep	18	21.7	5	29.4	23	23	P = 0.174
Very sleepy	9	10.8	3	17.6	12	12	

* Significant value at P<0.05

Table (3): Relation between functional outcomes of sleep of community dwelling elders and their excessive daytime sleepiness

Functional Outcomes of Sleep	The Epworth Sleepiness Scale								Test of Significance
	Getting enough sleep		Average hours of sleep		Very sleepy		Total (n = 100)		
	N(65)	%	N(23)	%	N(12)	%	N(100)	%	
Functional Outcomes of Sleep Total score									FET =4.492 P = 0.282
Poor	42	64.6	18	78.3	5	41.7	65	65	
Good	23	35.4	5	21.7	7	58.3	35	35	
Functional Outcomes of Sleep Subcategory score									
a- General Productivity									FET = 2.372 P =0.132
Poor	33	50.8	12	52.2	9	75	54	54	
Good	32	49.2	11	47.8	3	25	46	46	
b- Social outcome									FET = 6.369 P = 0.032*
Poor	26	40	16	69.6	7	58.3	49	49	
Good	39	60	7	30.4	5	41.7	51	51	
c- Activity levels									FET =0.462 P = 0.309
Poor	38	58.5	15	65.2	8	66.7	61	61	
Good	27	41.5	8	34.8	4	33.3	39	39	
d- Vigilance									FET =1.959 P =0.109
Poor	28	43.1	11	47.8	8	66.7	47	47	
Good	37	56.9	12	52.2	4	33.3	53	53	

* Significant value at P<0.05

Table (4): Relation between functional outcomes of sleep of community dwelling elders and their level of performance in activities of daily living

Functional Outcomes of Sleep	Katz Index of Independence in Activities of Daily Living						Test of Significance
	Partially Dependent		Independent		Total (n = 100)		
	N(45)	%	N(55)	%	N(100)	%	
Functional Outcomes of Sleep Total score							FET =2.473 P = 0.049*
Poor	33	73.3	32	58.2	65	65	
Good	12	26.7	23	41.8	35	35	
Functional Outcomes of Sleep Subcategory score							
a- General Productivity							FET = 0.15 P = 0.158
Poor	24	53.3	30	54.5	54	54	
Good	21	46.7	25	45.5	46	46	
b- Social outcome							FET = 0.673 P = 0.114
Poor	25	55.6	26	47.3	51	51	
Good	20	44.4	29	52.7	49	49	
c- Activity levels							FET = 4.994 P = 0.014*
Poor	23	51.1	16	29.1	39	39	
Good	22	48.9	39	70.9	61	61	
d- Vigilance							FET = 3.835 P =0.024*
Poor	26	57.8	21	38.2	47	47	
Good	19	42.2	34	61.8	53	53	

* Significant value at P<0.05   # No dependent elders in present study

Table (5): Relation between functional outcomes of sleep of community dwelling elders and their cognitive status

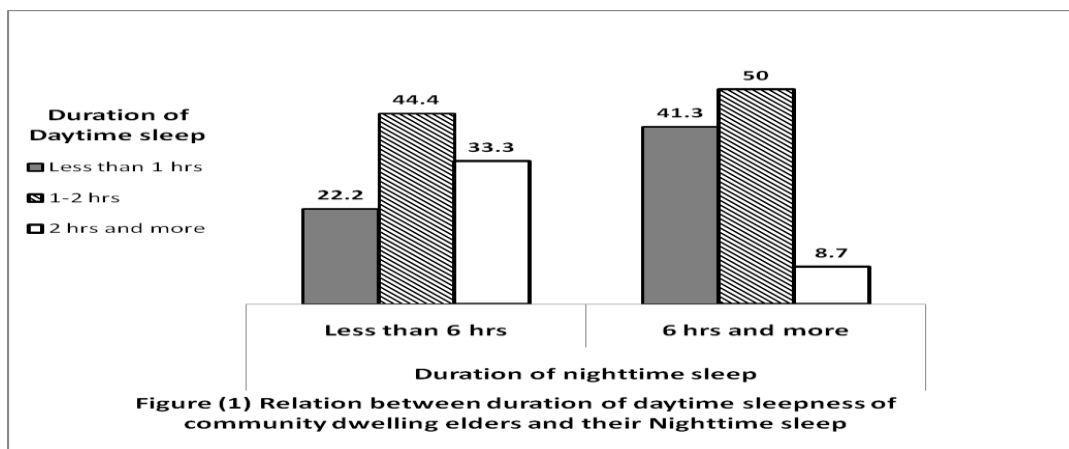| Functional Outcomes of Sleep	Cognitive status						Test of Significance
	Mild–Moderate cognitive impairment		Severe cognitive impairment		Total		
	N(83)	%	N(17)	%	N(100)	%	
Functional Outcomes of Sleep Total score							FET = 4.882 P = 0.019*
Poor	58	69.9	7	41.2	65	65	
Good	25	30.1	10	58.8	35	35	
Functional Outcomes of Sleep Subcategory score							
a- General Productivity							FET = 4.163 P = 0.027*
Poor	42	50.6	4	23.5	46	46	
Good	41	49.4	13	76.5	54	54	
b- Social outcome							FET = 3.145 P = 0.046*
Poor	39	47	12	70.6	51	51	
Good	44	53	5	29.4	49	49	
c- Activity levels							FET = 2.061 P = 0.082
Poor	48	57.8	13	76.5	61	61	
Good	35	42.2	4	23.5	39	39	
d- Vigilance							FET = 0.279 P = 0.181
Poor	43	51.8	10	58.8	53	53	
Good	40	48.2	7	41.2	47	47	

* Significant value at P<0.05

Figure (1) Relation between duration of daytime sleepness of community dwelling elders and their Nighttime sleep

Test of significance: Fisher's Exact Test = 10.125 (P value = 0.004*)
* Significant value at P<0.05

Table (6): Relation between Sleeping Pattern of community dwelling elders and their functional outcomes of sleep, level of performance in activities of daily living, cognitive status, and excessive day time sleepiness

Sleeping patterns	Functional outcomes of sleep			Katz index of independence in ADL			Cognitive status			Egworth sleepiness scale			
	Poor %	Good %	Test of significance	Dependent %	Independent %	Test of significance	Mild–Moderate Cognitive Impairment %	Severe cognitive impairment %	Test of significance	Getting enough sleep %	Average hours of sleep %	Very sleepy %	Test of significance
General state of sleep													
- Good	35.4	65.7	FET=8.512 P=0.003*	35.6	54.5	FET=3.557 P=0.027*	45.8	47.1	FET=0.009 P=0.209	56.9	13	50.0	FET=13.993 P=0..042*
- Bad	64.6	34.3		64.4	45.5		54.2	52.9		43.1	87	50.0	
Duration of daytime sleep (Hours)													
- Less than 1 hour	26.2	40.0	FET=3.912 P=0.037*	17.8	41.8	FET=6.277 P=0.012*	30.1	35.3	FET=0.291 P=0.369	32.3	17.4	50.0	FET=6.967 P=0.456
- 1>2 hours	46.2	48.6		53.3	41.8		47.0	47.1		50.8	43.5	33.3	
- 2 hours and more	27.7	11.4		28.9	16.4		22.9	17.6		16.9	39.1	16.7	
Duration of nighttime sleep (Hours)													
- Less than 6 hours	55.4%	51.4%	FET=0.142 P=0.155	62.2	47.3	FET=2.205 P=0.053	50.6	70.6	FET=2.246 P=0.071	50.8	69.6	41.7	FET=3.225 P=0.501
- 6 hours and more	44.6	48.6%		37.8	52.7		49.4	29.4		49.2	30.4	58.3	
Wake up at night													
- Yes	100.0	97.1	FET=1.857 P=0.350	100.0	98.2	FET=0.818 P=0.550	100.0	94.1	FET=4.882 P=0.170	100.0	100.0	91.7	FET=4.606 P=0.128
- No	0.0	2.9		0.0	1.8		0.0	5.9		0.0	0.0	8.3	
Difficulty to fall a sleep													
- Yes	98.5	97.1	FET=0.200 P=0.460	95.6	100.0	FET=2.469 P=0.2	97.6	100.0	FET=0.414 P=0.687	98.5	100.0	91.7	FET=2.695 P=0.292
- No	1.5	2.9		4.4	0.0		2.4	0		1.5	0.0	8.3	
Feeling comfort at morning													
- Yes	7.7	34.3	FET=11.289 P=0.001*	15.6	18.2	FET=0.120 P=0.2	15.7	23.5	FET=0.613 P=0.189	16.9	0.0	50.0	FET=2.307 P=0.098
- No	92.3	65.7		84.4	81.8		84.3	76.5		83.1	100.0	50.0	

* Significant value at P<0.05

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