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Sleep quality in elderly patients diagnosed with osteoarthritis at orthopedic outpatient clinic

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***Abstract*---**Background: Elderly patients have osteoarthritis pain who suffering from sleep latency, difficulty maintaining sleep, sleep fregmentation and early morning are all symptoms of poor sleep. Aim: This study aims to assess sleep quality in elderly patients diagnosed with osteoarthritis. Study Design: : A descriptive research design was used for conducted this study. Setting: The study was conducted at the orthopedic outpatient clinic of Fayoum General Hospital. Sample: A purposive sample was used in this study and included 169 of elderly patients diagnosed with osteoarthritis (demographic characteristics, past and present medical history and patients' knowledge about osteoarthritis). Tool II: Two standardize tools; Part I- Pittsburgh Sleep Quality Index to assess sleep quality. Part II- The Visual Analog Pain Scale to assess pain severity. Results: the presenting study showed that, (90.9%) of patients with osteoarthritis were found to have poor sleep quality, 80% had unsatisfactory knowledge, 92.9% of females were having poor sleep more than men. 60 % of patients had severe pain (VAS > 7). 55.7% of patients had sleep latency, 59.2% had short sleep duration. Statistically significant relation between total knowledge, sleep quality and pain with p value (p=0.001*). Conclusion: The pain significantly disturbed sleep quality in most of patients and had sleep difficulties (early morning, sleep

onset latency and sleep to short duration), had unsatisfactory knowledge about osteoarthritis. A statistically significant relation between total knowledge, sleep quality and pain. Recommendations: The study recommended continuous Health educational program's should be provided to all patients attending the orthopedic clinics to raise public awareness about osteoarthritis, further researches and educational activities are needed on a wide range particularly in the area of orderly's lifestyle changes to improve self-management and prevent sleep problems related to osteoarthritis.

***Keywords*---**osteoarthritis, elderly, sleep quality, pain.

Introduction

Many physically and psychologically changes are commonly observed with normal ageing, in addition to age-related changes in sleep quality, but sleep problems are more common in patients with chronic pain, and elderly complaints include changes in sleep duration and pattern, such as taking a long time to fall in sleep, waking after sleep onset, and less efficient sleep. It can also lead to headaches, agitation disoriantation, weariness, and daytime dysfunction in the elderly [1] Osteoarthritis (OA) is a kind of arthritis that causes the cartilage in joints to break down over time. It's also known as adegenerative joint disease or "wear and tear" arthritis, and it causes serious health issues such as joint discomfort, inactivity, and impairment. OA is very frequent in the elderly, and it affects about 10% of people >60 years of age and Occur in major weight-bearing joints such as the knees, hips, and lower back. It can also be found near the base of the thumb, tiny finger joints, and the neck [2]

Poor sleep quality has been linked to a number of negative health effects, including cardiovascular disease, depression, and death. Musculoskeletal pain, which affects 14–47% of the general population and has a substantial influence on physical function and quality of life. As osteoarthritis typically represent musculoskeletal pain [3] Although osteoarthritis had been considered to be a noninflammatory arthritis, it is now thought to be a disorder involving continuous low-grade inflammation and release of cytokines pathways. Its incidence varies depending on how OA is defined, which joints are analyse , and which group is researched.14 million persons in the United State (US) have symptomatic OA, more than half those are < 65 years of age [4]

Osteoarthritis affects a large percentage of the world's population. Osteoarthritis affected 20% of persons over the age of 40 in the west of Turkey, but 14.8 percent of the senior population over the age of 50 in the south. In the Corea, the incidence has been 14.3 percent over 50 years. Due to an increase in the incidence of osteoarthritis risk factors, such as obesity, low physical activity, and joint injury, the incidence of OA is rising [5] Elderly with osteoarthritis experience pain in a variety of ways that influence their sleep and quality of life. Irritability, sleeplessness, depression, and other physical and psychological problems are all caused by it. As a result, a disease exacerbates a reduction in physical activity and the loss of physical function. Patients with OA have joint stiffness or rigidity

in the morning when they wake up for more than 30 minutes, and this persists after the immobilization is removed [6]

Insomnia is a widespread disorder that affects 20% of the world's population. Insomnia is a chronic sleep problem that affects 50–70% of persons over the age of 65, and it affects roughly 40% of older patients with degenerative diseases such as osteoarthritis. In Western Europe, the prevalence ranges between 20% and 40%. The elderly female has a higher incidence of sleep problems, with over 75% of senior women in Europe having sleep disorders in elderly care settings [7] Disturbed sleep is more common in patients suffering from the pain caused by musculoskeletal disorders; around 88 % of patients report sleeping problems. There is a relation between pain and poor sleep quality. The pain is rise sleep disturbance and anexiety during the night, inaddition to decrease in sleep quality and quantity Because pain and poor sleep quality have an impact on neurobiological and inflammatory mechanisms, a two- to three-fold increase in the risk of developing pain conditions [3] Geriatric health nurse must be knowlledgeable aboyt all topics of osteoarthritis the aetiology, complications, pharmacological and nonpharmacological interventions. Also, employ the nursing process phases of assessment, nursing diagnosis, planning, implementation, and evaluation to assist elderly patients in managing disease, controlling pain, and improving sleep quality [8]

Significance of the Study

In Egypt, progression of osteoarthritis is more in elderly pateints aged over 70 years, the osteoarthritis incidence is high in elderly females 74.1% than males 25.4% due to hormonal changes especially after menopause, osteoporosis and severity of osteoarthritis rise due to oestrogen withdrawal, that can increase degenerative changes in different joints, muscle strength changes, and much more fat cluster loading on joints and knees [9] Osteoarthritis is a significant public health problem worldwide, and it is the most common disease in Egypt, affecting approximately 6 million people and putting senior people at risk of sleep disruption. Its incidence in Egypt is high, with more than 50 % of the population above 65 years old experiencing from osteoarthritis [10]

Poor sleep quality is common in elderly pateints musculoskeletal disorders such as osteoarthritis; it is estimated that almost half of persons aged 65 years or older have difficulty sleeping, both beginning and maintaining sleep. Insomnia is the most frequent sleep problem among the elderly. It is represented 50–70% of elderly aged 65 years old and more [11] Geriatric health nurse has important role in assisssting the pateints with osteoarthrits, elderly need comprehensive health education had a positive outcomes on improving patients' level of knowledge and practices regarding osteoarthritis, especially managing the disease, improving quality of sleep [12] Sleep quality is considered to be one of most prevalent affected portion of osteoarthritis that had serious complications on elderly patients life. So, this study was done to assess sleep quality in elderly patients diagnosed with osteoarthritis.

Aim of the study

This study aims assess sleep quality in elderly patients diagnosed with osteoarthritis at Orthopedic Outpatient Clinic, through:

1- Assessing elderly patient's knowledge related to osteoarthritis.
2- Assessing pain level result from osteoarthritis.
3- Assessing usual sleep quality of patients diagnosed with osteoarthritis..

Research questions

1- What is elderly patients' knowledge level related to osteoarthritis?
2-What is pain level result from osteoarthritis?
3-What is the usual sleep quality of patients diagnosed with osteoarthritis?

Subjects and Methods

Research design

A descriptive research design was used to achieve the aim of the current study.

Research setting

The study was conducted in the Orthopedic Outpatient Clinic of Fayoum General Hospital that was represented 2 clinics and included four nurses and 6 doctors. The working in this clinics is 6 days per week from Saturday to Thursday from 9 am until 2 pm.

Subjects

The subjects of the existing study were 300 students who were randomly selected A multi stage random sample technique was used for selection of primary school students.

Sampling technique

A purposive sample was used in this study to collect the data for about four months (from June 2021 to september 2021). The sample consisted of 169 elderly patients diagnosed with osteoarthritis (98 females represented 57.9%, 71 males represented 42.1%), who attending the study setting during the time of the study. The sample size caculated by a simplified formula Yamane [13]. A 95 confidence level and p = 0.5 are assumed for:

$$n = \frac{N}{1 + N\,(e)2}$$

n = sample size
N = population size is 300
e = 0,05 is the level of precision.

$$n = \frac{300}{1 + 300\,(0.05)2}$$

n = 169

The actual size of sample 169 elderly patients diagnosed with osteoarthritis through academic year 2019 – 2020

Tools of data collection

The data for this study was collected by using the following tools

1st tool: A structural interviewing questionnaire: was used in the study, it was developed by investigator after reviewing the national and international related literature and contains three parts:
Part I: concerned with elderly patients demographic data related to variables such as such as; age, gender, level of education, marital status, occupation before retirment, monthly incom, place of residence and number of family members.
Part II: Concerned with past and present history of elderly pateints diagnosed with osteoarthritis (OA) such as: history of chronic diseases (comorbidities), family history, duration of osteoarhtritis, signs and symptoms, treatment regimen and body mass index (BMI). Calculation of body mass index (BMI) to indicate degree of obesity using equations according to CastilloMartinez et al., [14] as follows:
BMI = (weight in kilograms) / (height in meter)2
- Underweight < 18 - Normal BMI > 18 – 24.9
- Overweight ≥ 25 – 29.9 - Obese ≥ 30
- Morbid obese > 40
Part III: concerned with Elderly patients' knowledge questionnaire was assessed about osteoarthritis including: main cause of osteoarthritis, risk factors, signs and symptomes, complications, treatment, non pharmacological intervention and prevention.

Scoring System

The answers were formulated as: correct and incorrect answer, one point was awarded for each correct answer correct, incorrect answer took zero.

Total knowledge was classified as follows

- Unsatisfactory knowledge < 50%
- Satisfactory knowledge ≥ 50%

Tool 2
Part I- Pittsburgh Sleep Quality Index (PSQI)

This tool was developed by Buysse et al., [15]. It was self-report questionnaire to assess the sleep quality and quantity. The original version was designed to measure sleep report, over a one month interval; the scale showed the sleep disturbance in the last month or not and shows its prevalence. Composed of 7 componants and 19 questions, the componants include: data about subjective sleep quality, tim, latency,sleep duration, habitual sleep effeicacy, take the sleep drugs, daytime defects and use of medication.

Scoring system

Each componant score range from 0 to 3, all scores of 7 componants are collected. the total score of the scale from 0 to 21.

Total scoring system for Pittsburgh Sleep Quality Index (PSQI) was classified as follows

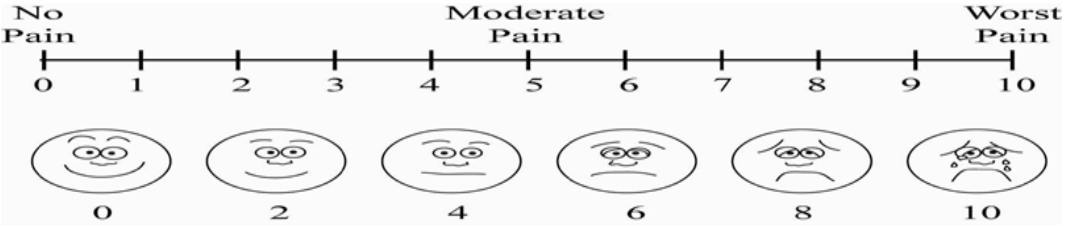
- Good sleep quality < 5
- Poor sleep quality ≥ 5

Part II- The Visual Analog Pain Scale (VAS)

Pain rating scale was first used by Hayes and Patterson in 1921 and then developed by Degado et al., [16]. This was standardized scale to assessing pain severity based on self-reported measures of Symptoms that were recorded with one point, composit of the length of a 10-cm line has the two ends ends of scale such as "no pain" on the left end (0cm) of the scale and the"worst pain "on the right end.

Scoring system

Determined by measureing the distance from zero point to number reported by the patient along the length of 10 cm severity of the pain classified as following:



(0) indicates “no pain” on the left end of the scale.
(1 –3) indicates mild pain (little interfering with activities of daily living).
(4 –6) indicates moderate pain (interfering significantly with activities of daily living).
(7 –10) indicates severe pain (disabling, unable to perform activities of daily living).
(10) indicates " worst pain " on the right end of the scale.

Validity

The validity of the tool was tested through a panel of three experts from Geriatric Health Nursing Staff from faculty of nursing at Helwan University, Fayoum University and zagazig University to review relevance of the tools for comprehensive, understanding and applicability.

Reliability

To assess reliability, the study tools were tested for its internal consistency by the pilot subject's reliability for calculating cronbach's Alpha which was knowledge 0.745 for the interview questionnaire sheet, 0.80 for Pittsburgh Sleep Quality Index (PSQI) tools sheet. And 0.89 The Visual Analog Pain Scale (VAS).

Ethical considerations

Ethical consideration was be gained from scientific ethical committee of Helwan University, elderly patients in the study are voluntary and was given complete full information's about the study and their role before signing the informed consent. The ethical considerations were including explaining the purpose and nature of the study, staining the possibility to withdraw at any time, confidentiality of the information were guaranteed. Ethics, values, culture and beliefs will be respected.

Preparatory phase

It was included reviewing of past, current, national and international related literature and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop tools for data collection.

Pilot study

The pilot study has been conducted to test the clarity, applicability and understand ability of the tool. It has been conducted on (10%) equal (17 of elderly patients). Based on the results, no modification was done. Subjects included in the pilot study were excluded from the study.

Field work

Before conducting the study, A written approval letter issued from Dean of Faculty of Nursing, Helwan University. The letter was directed to the manager of Orthopedic Out-patient Clinic of Fayoum General Hospital in Fayoum City for conducting the study. Including the aim of the study to obtain permission after establishing atrustful relationship.each subject interviewed individually by the researcher to explain the study purpose and its procedure to them to get their consent and cooperation. Data was collected in four months (from June 2021 to September 2021) through 3days/week (Saturday – Monday – Wednesday) from 9 am - 2 pm, till the needed sample was completed. Interiew of elderly patients, oral approval obtianed from subjects, then explained the purpose of the study to collect sociodemographic data and assess knowledge, pain and sleep quality. Study collected through structured face to face interiew and the entire tooles, each tool took about 20 minutes and met the patients 3 dayes per week. The researcher taken aproximetly 4 patients each day consistes about 12 patients per week, about 48 per months, total number of patients = 169 patient.

Administrative Item

After explanation of the study aim and objectives, an official permission was obtained from the Dean of faculty of nursing, Helwan University and the general manager of Fayoum General Hospital asking for cooperation and permission to conduct the study.

Statistical analysis

Data collected from the study sample was revised, coded and entered using personal computer (PC). Computerized data entry and Statistical analysis were fulfilled using the statistical Package for the Social Science (SPSS), version 24. Data were presented using descriptive statistics in the form of frequencies, percentage, Chai-square test $(X)^2$ was used for comparisons between qualitative variables, spear mean correlation measures the strength and direction of association between two ranked variables . Also, used mean ± and standard deviation (± SD). Appropriate inferentialstatistics such as ―F‖ test or ―t‖ test will be used as well, regression analysis was used after testing for normal distribution, normality, and homoscedasticity, and analysis of variance for the full regression models were done.

Significance of the results

- Highly significant at p-value > 0.01.
- Statistically significant was consider at p-value > 0.05.
- Non-significant at p-value < 0.05.

Results

Table 1 : Demonstrates that, demographic characteristics of elderly who suffer from osteoarthritis. According to elderly age 47.2% of the age between 65 < 70 years, the mean age ± SD were 66.01+ 6.043. Regarding to level of education 38.5% of them not read and write, while 23.6% of them were have primary education. Regarding to marital status 79.9% ware married. Regarding to occupation before retirement 53.9 % of them employee. Regarding number of family members. 43.7% of them > 4 members. Figure 1: Shows that, 57.9% of the study sample were female, while, 42.1% of them were males. Figure 2:Illustrates that, regarding elderly patient place of residence, 52.1% of them live in urban area, while 47.9% of them live in rural.

Figure 3: Shows that, regarding elderly patients monthly income, 51.5% of them the monthly income not enough, while, 48.5% of the monthly income enough. Table 2: Reveals that, regarding patients medical history shows that, 94.6% of elderly have health problems. 71.0% of them complain hypertension. 65.1% of complain of diabetics, 59.2 % of them no family history of osteoarthritis, 47.3% of them the duration of osteoarthritis > 5 years, regarding to treatment regimen 93.7 % of them taking drug treatment, and 56.2 % of them the body mass index Obese ≥ 30. Figure 4: Shows that, 100.0% of them complain of pain, 71.1% of them complain of joint stiffness, 56.2% of them physical limitation, and 14.8% of them complain all of above. Figure 5: Shows that, 59% of them had family history

and 40.8% didn't have family history of osteoarthritis. Table 3: The study shows that, 82.3% of elderly have incorrect knowledge regarding prevention of osteoarthritis, 78.2% of them incorrect knowledge regarding non pharmacological intervention of osteoarthritis that improve the pain, 76.3% of them incorrect knowledge regarding the risk factors of osteoarthritis. While, 47.4% of them correct knowledge regarding symptoms of osteoarthritis and 41.4% of them correct knowledge regarding cause of osteoarthritis.

Figure 6: Shows that, regarding total knowledge of elderly related to osteoarthritis, reveals that 80.0% of elderly have unsatisfactory total knowledge, while 20.0% have satisfactory total knowledge related to osteoarthritis.value = .000. Table 4: Illustrates the elderly ptients regarding to Pittsburgh sleep Quality index, the current study revealed that, 47.3% of the elderly in the past month go to the bed between 8-10 am every days. 50.3% of them 1-3 hours taken you to fall a sleep each night Also, 53.2 % of the elderly gotten up in the morning 5-7 am. While, 59.2% of elderly < 6 hours actual sleep do you get at night and 47.3% of them sleep latency between 30-6- minutes every days. Table 5: Showes that, a highly statistical significant relationship were found between subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, daytime dysfunction and sleep medication. Regarding to PSQI Components scores p= 0.000*.

Table 6: Shows that, number of good and bad sleepers according to PSQI .The result show that the majority of elderly 90.9 % bad sleeper according to PSQI. Figure 7: Shows that , sleep quality regarding to gender, 87.3% of elderly males PSQI Scores ≥ 5. while, 92.9% of elderly females PSQI Scores ≥ 5. Figure 8: Shows that, regarding severity of pain among elderly patients in the study sample, the current study revealed that, 60.0% of them complain severe pain, 35.0% of them complain worst pain, 10% of them moderate pain and 5% of them mild pain. Table (7): Describes that, there were highly statistically significant relation between elderly patients socio demographic characteristics as level of education, gender, marital status, place of residence, number of family members, monthly income, occupation before retirement and total satisfactory knowledge with p value (p=0.001*). but there was no statistical significant relation between total satisfactory knowledge and elderly age.Table 8: Describes that, a statistically significant relation between total sleep quality as measured by PSQI and age, level of education, sex, marital status, place of residence, numbers of family members and occupation before retirement with p value (p=0.001*). But there was no statistical significant relation between total satisfactory knowledge and elderly monthly income. Table 9: Reveals that, a statistically significant relation between total knowledge, sleep quality and pain with p value (p=0.001*).

Table (1): Demographic characteristics of elderly patients diagnosed with osteoarthritis(n= 169)

Items	No	%
Age		
60 < 65 years	69	41.1
65 < 70 years	80	47.2
≥ 70 years	20	11.7

Mean ± SD 66.01+ 6.043		
Level of education		
Not read and write	65	38.5
Read and write	32	18.9
Primary education	40	23.6
Secondary education	22	13.1
University education or more	10	5.9
Marital status		
Single	4	2.3
Married	135	79.9
Divorced	14	8.4
Widowed	16	9.4
Occupation before retirement		
Employee	91	53.9
Manual work	28	16.6
Farmer	50	29.5
Not work	0	0.0
Number of Family members are living with you		
≤ 2 member	30	17.8
2 ≤ 4 members.	55	32.6
> 4 members	74	43.7
No one	10	5.9

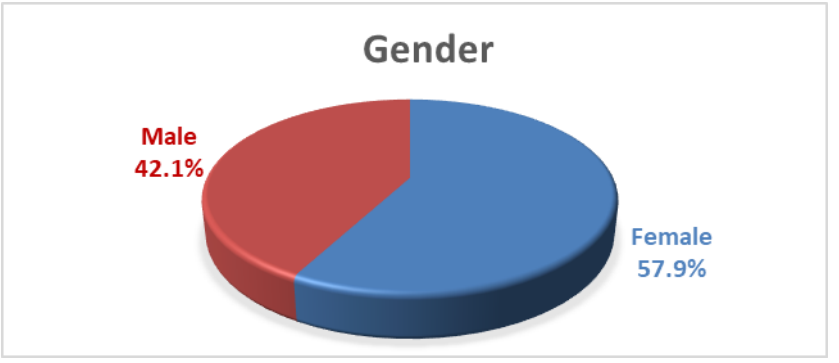


Figure (1): Percentage distribution of the elderly patients regarding to their gender (n=169)

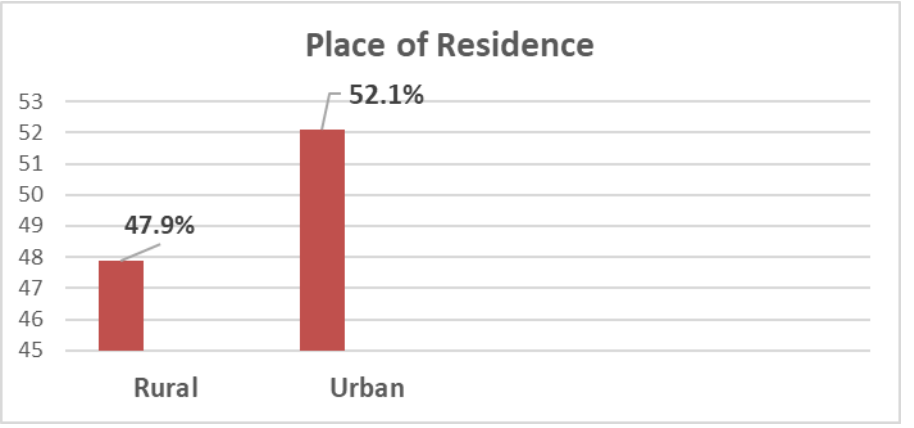


Figure (2): Percentage Distribution of the Elderly Patients Regarding to their Place of Residence (n=169)

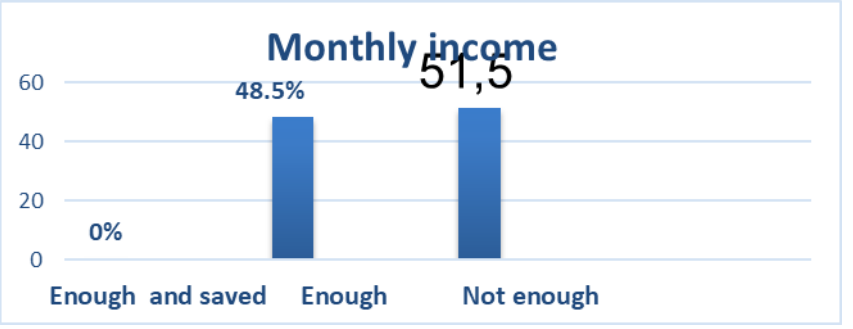


Figure (3): Percentage distribution of the elderly patients regarding to their monthly income (n=169)

Table (2): Frequency distribution of the elderly patients regarding to their medical history (n=169)

Items	No.	%
Health problems		
Yes N0	160 9	94.6 5.4
**What the health problems(n=160)		
Hypertension	120	71.0
Diabetics	110	65.1
Heart diseases	50	29.6
Obesity	95	56.2
Kidney diseases	45	26.6
Others	30	17.8
Duration of osteoarthritis		
< 3 years 3to 5 years > 5 years	24 65 80	14.2 38.5 47.3

**Treatment regimen		
Drug treatment Physical therapy Making compresses All of above	150 80 55 45	93.7 47.3 32.6 26.6
Body mass index (B M I):		
Under weight < 18	14	8.3
Normal weight 18- 24.9	40	23.7
Over weight 25 – 29,9	20	11.8
Obese ≥ 30	95	56.2

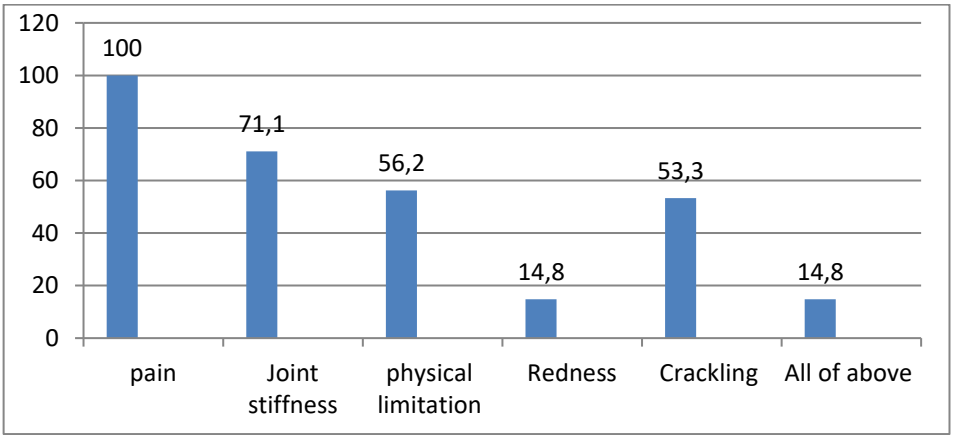


Figure (4): Percentage distribution of the elderly patients regarding to signs and symptom of diseases (n=169)

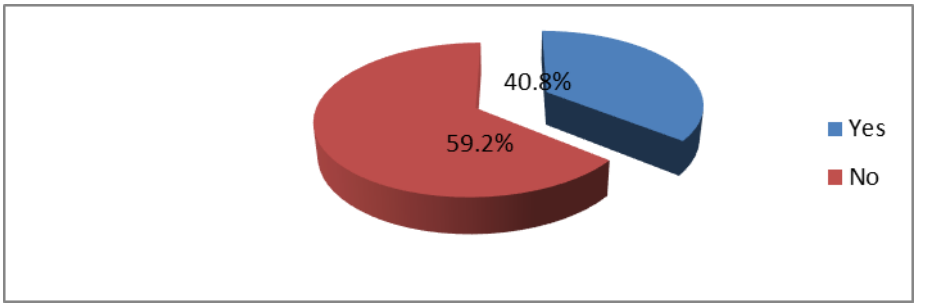


Figure (5): Family history of osteoarthritis among elderly patients in the study sample (n=169)

Table (3): Elderly patients knowledge related to osteoarthritis (n =169)

Elderly patient's knowledge	Correct		Incorrect	
	NO	%	NO	%
Main cause of osteoarthritis:	70	41.4	99	58.6
Risk factors of osteoarthritis	40	23.7	129	76.3

Signs & ymptomsosteoarthritis	80	47.4	89	52.6
Complications of osteoarthritis	50	29.5	119	70.5
Treatment for osteoarthritis	65	38.4	104	61.6
Non pharmacological intervention of osteoarthritis that improve the pain	35	20.8	134	78.2
Prevention of osteoarthritis	30	17.7	139	82.3

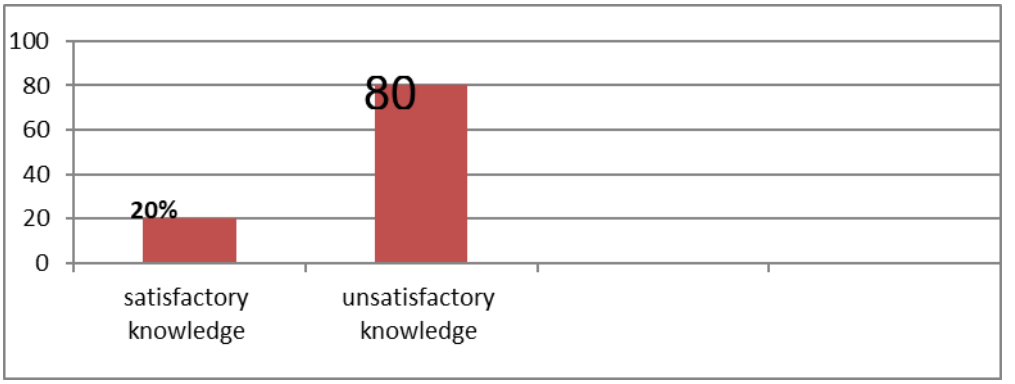


Figure (6): Elderly patients total knowledge related to osteoarthritis (n=169)

Table (4): Frequency distribution of the elderly patients regarding to pittsburgh sleep quality index (PSQI) (n=169)

Items	No.	%
Past month when have you usually one to bed		
8-10 pm 11-1 am -≥ 1 am	80 60 29	47.3 35.5 17.2
Past month how long (in minutes) has it taken you to fall a sleep each night		
10-12 minutes' 1-3 hours more than one hours	75 85 9	44.3 50.3 5.4
-Past month when have you usually gotten up in the morning		
5-7 am 7-10 am ≥10 am	90 60 19	53.2 35.5 11.3
Past month how many hours of actual sleep do you get at night		
Short < 6 hours/day Normal 7-8 hours/day Long ≥ 9 hours	100 55 14	 59.2 32.5 8.3
Sleep latency		

Less than 30 min 30-60 min ≥ 60 min	75 80 14	44.3 47.3 8.4

Table (5): Comparison of mean values of mean of PSQI components scores of the studied elderly patients (n=169)

PSQI Components scores	M±SD	P
Subjective sleep quality	1.58±0.63	0.00**
Sleep latency	2.4±0.56	0.00**
Sleep duration	1.85±0.61	0.00**
Sleep efficiency	1.89±0.72	0.00**
Sleep disturbance	1.97±0.36	0.00**
Daytime dysfunction	1.82±0.52	0.00**
Sleep medication	1.85±0.61	0.00**

*p≥0.05 (significant) ** p≥0.01 (high significant)

Table (6): Number of good and poor sleepers according to psqi for elderly patients (n=169)

Sleep Quality	Phase		P
	No	%	
Good sleeper	16	9.1	0.00**
Poor sleeper	153	90.9	0.00**
PSQI global scores Median(min-max)	12.0 (6-17)		

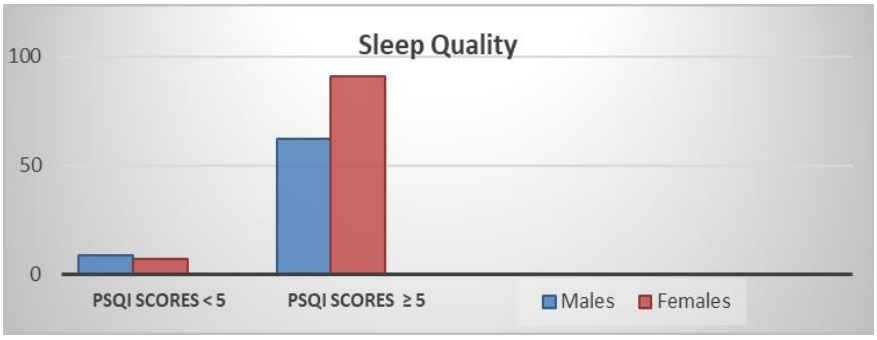


Figure (7): Difference of sleep quality according to gender among elderly patients in the study sample (n=169)

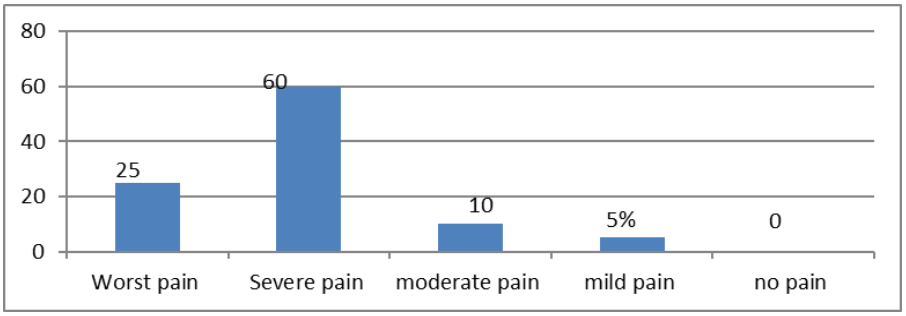


Figure (8): Severity of pain among elderly patients in the study sample (n= 169)

Table (7): Relations between elderly patients total knowledge and their socio-demographic characteristics (n=169)

Demographic data		Total Knowledge			T-test	
		Mean	±	SD	t or F	P-value
Age	60 < 65	10.733	±	5.865	1.396 F	0.250
	65 < 70	9.077	±	6.491		
	≥70	8.667	±	7.742		
level of Educational	Not Read and write	9.700	±	6.557	4.710 F	>0.001*
	Read and write	8.923	±	5.569		
	Primary education	7.833	±	5.388		
	Secondary education	11.308	±	6.562		
	University education or more	9.655	±	6.333		
Gender	Male	9.567	±	5.088	5.284 F	0.001*
	Fameless	8.345	±	6.876		
Marital status	Single	7.786	±	5.078	4.490 F	0.001*
	Married	9.768	±	5.987		
	Divorced	8.453	±	45055		
	Widowed	6.766	±	7.786		
Place of residence	Urban	8.599	±	6.987	4.489 F	0.001 *
	Rural	9.399	±	6.987		
	Enough and saved	8.388	±	5.990		0.001 *
Monthly income	Enough	10.599	±	8.987	3.890 F	
	Not enough	9.367	±	6.876		
No family members	≤ 2 member	7.675	±	5.099	4.870 F	0.001 *
	2 ≤ 4member	6.790	±	4.098		
	> 4 member	9.567	±	5.890		
Occupation before	Employee	9.657	±	7.762		

retirement	Manual work	9.632	±	6.865	6.712 F	>0.001*
	Farmer	8.076	±	7491		
	Not work	0	±	0		

(*) Statistically significant at p>0.001

Table (8): Relations between Elderly Patients Sleep Quality and their Socio-Demographic Characteristics (n=169)

Demographic data		Total Sleep Quality			T-test	
		Mean	±	SD	t or F	P-value
Age	60 < 65	1.333	±	2.066	7.396 F	<0.001*
	65 , 70	2.231	±	4.475		
	≥ 70	8.833		7.388		
level of Educational	Not Read and write	2.044	±	3.228	4.710 F	<0.001*
	Read and write	4.667	±	6.742		
	Primary education	4.692	±	6.529		
	Secondary education	5.077	±	6.551		
	University education or more	4.655	±	5.333		
Gender	Male	1.567	±	2.088		
	Fameless	8.345	±	6.876		
Marital status	Single	7.786	±	5.078	4.490 F	0.001*
	Married	9.768	±	5.987		
	Divorced	8.453	±	45055		
	Widowed	6.766	±	7.786		
Place of residence	Urban	8.599	±	6.987	4.489 F	0.001*
	Rural	9.399	±	6.987		
	Enough and saved	8.388	±	5.990		0.225
Monthly income	Enough	3.453	±	4.055	1.890 F	
	Not enough	4.333	±	5.068		
No family members	≤ 2 member	4.766	±	5.786	4.870 F	0.001*
	2≤ 4 member	5.566	±	6.788		
	> 4 member	5.339	±	6.786		
Occupation	Employee	4.355	±	5.087		

before retirement	Manual work	4.377	±	5.887	6.712 F	<0.001*
	Farmer	5.322	±	6.446		
	Not work	0	±	0		

(*) Statistically significant at p>0.001

Table (9): Correlations between a elderly patients total knowledge, sleep quality and pain

Total Knowledge	Correlation	
	Sleep Quality	Pain
	-.250**	-.261**

(**) Statistically significant at p> 0.001

Discussion

Osteoarthritis is known as joint degenerative disease, is a common, chronic disorder caused by wear and tear and gradual articular cartilage loss. Osteoarthritis is the most commonly health problem among elderly persons, and its incidence rises with age. It has an impact on all aspects of a person's life, including sleeping patterns and sleep quality [17]One of the most common comorbidities linked with knee OA is sleep disturbance. According to previous studies, sleep disruption affects 28 percent to 80 percent of people with knee OA. Insomnia is the most common kind of sleep disorder characterized by difficulty falling asleep, remaining asleep, or getting up too early, all of which can lead to daytime dysfunction. The most prevalent symptom of osteoarthritis is pain, which has a significant impact on the sleep quality of people [18] Therefore, the presenting study aimed to assess sleep quality in elderly pateints diagnosed with osteoarthritis.

Regarding the results related to demographic characteristics; the age of elderly patients, the current study found that, less than half of them the age between 65 > 70 years the mean age Mean ± SD 66.01+ 6.043. This findings agreement with Murphy et al., [19], the study conducted in Western Ontario and McMaster Universities about "evaluated occupational therapist–delivered cognitive–behavioral therapy for knee osteoarthritis in fifty-seven participants, showed that, more than half of the study sample the age ranged between 65-70 years old has been diagnosed with osteoarthritis. From the researcher point of view that, the prevalence of symptomatic OA increase with age regardless of sex,origin and culture, aging and OA are closely related. The aging contributed to OA by several potential mechanisms, as follows: age-related inflammation, oxidative stress, dysfunction in energy metabolism and muscle weakness.

Regarding gender, marital status and living with family, the current results showed that, more than half of studied patients were females, more than three quarters of patients were married and majority of patients living with family members. This finding agrees with a study in Egypt of Basuny et al., [6] about "evaluated responsiveness of pain and associated health issues of patients with knee osteoarthritis to the revulsive compresses admitted to orthopedic and

rheumatology outpatient clinics of Zagazig University hospitals “recorded that, more than three quarters of knee osteoarthritis were females and the almost of patients were married and living with family.

Also, this finding agreement with other study conducted in Fayoum, Egypt, Mohsen et al., [20] about “physical functional status among patients with hip osteoarthritis at Fayoum University Hospitals” recorded that, females have a higher incidence of general osteoarthritis than men after age 50, but more in males before 50 years of age.

Also, this finding agreement with Uludağ & Kaşikçi [21], the study conducted in Erzurum Palandoken Public Hospital about “evaluated the effect of local cold compression upon pain and movement restriction in 70 patients with knee osteoarthritis who presented to orthopedics and Traumatology, Physical Treatment and Rehabilitation Policlinics “who found that most of the patients were females and all patients were married.

Regarding elderly patients level of education, the results showed that, more than one thirds of them not read and write and minority of them had university education or more, this result agreement with Uludağ & Kaşikçi [21] more than one third were illitrate and high education represented 1.6%. While disagreement with Abdoos et al., [22] about “the relationship between demographic and occupational characteristics and disability severity” in 97 of patients with knee osteoarthritis referring to the novin private physiotherapy clinic of semnan university of medical sciences in Semnan City, Iran found that, mostlt of studied sample were university education.

From the researcher point of view that, low education, non-managerial occupation and low-income status are related to knee pain. But, people with high educational level can care for themselves and their wellbeing more than those with low educational level, and low education can contribute to poor awareness of disease and management.

Regarding elderly patients' place of residence, the current findings showed that, more than half of studied patients live in urban areas. This result agreement with Sheikh et al., [23] the study conducted in Islamabad in Pakistan about “assessed Risk Factors for Osteoarthritis of Knee Joint in 110 patients with OA at HBS General Hospital” who found that, more than half of patients live in urban areas. From the researcher point of view that, the majority of patient live in urban areas is the work may difficult and stressful hard may cause strain on joint all of them may be risk factors of osteoarthritis.

Regarding elderly patients occupation before retirement, the results showed that, more than half of patients were employee before retirement, this finding in the same line with Choojaturo et al., [24], the study conducted in Thailand, about “evaluated factors associated with access to health services and quality of life in 618 knee OA patients who received care at 16 hospitals” found that, more than three-quarters of patients were employee before retirement. Regarding monthly income, the result found that, more than two third of patients the monthly income not enough, this result with the same line Choojaturo et al., [24] the

study found that, more than two third of patients were low income and the monthly income not enough. From the researcher point of view that, the low-income population is typically engaged in hard physical work, that increases the pressure on the knee joints, thereby exacerbating any cartilage damage.

Regarding the findings related to patients' past and present medical history; the elderly patients health problems, mostly of them complain health problems, more than third of them complain hypertension and diabetics. Also, more than half of them were obese. This results in the same lin with by Vitaloni et al., [25], who conducted a study in six countries: Colombia, Spain, Italy, Mexico, the USA, and Venezuela, to evaluated 1512 of patients' view of OA: the Global Osteoarthritis Patient Perception Survey (GOAPPS), reported that, more than four fifths (94,5%) of patients had comorbidities, especially hypertension, and obesity.

Also, This result agreed by Uludağ & Kaşikçi [21] the study conducted in Pakistan about "Patients with knee OA had another disease apart from osteoarthritis". The study found that, more than third of them complain hypertension and diabetics. Also, the majority of them are obese. From the researcher point of view that, the mechanism may include ischemia below the cartilage of patients with knee OA due to hypertension; this form of ischemia may inhibit articular cartilage metabolism and bone remodeling.

Regarding family history to OA, this results found that, more than half had family history of OA, and less than half of them the duration of osteoarthritis more than fives years. the study with the same line the Peat et al., [26] the study conducted in USA about "Knee pain and osteoarthritis in older adults: a review of community burden and current use of primary health care". Who reported that, more than half of elderly patients had family members with OA and the duration of osteoarthritis more than fives years.

Regarding the patients signs and symptoms of the disease. In this study showed that, the majority of them complain of various levels of pain. Also, more than two third of them complain joint stiffness, and more than half of them complain physical limitation and crackling sound when moving this study agreement with Rangasamy et al., [27] the study conducted in India about "evaluated sleep disturbance 150 patients with osteoarthritis selected from outpatient department of orthopedics at a tertiary health care center, Tagore Medical College and Hospital". Who reported that, (78 %) of the OA patients have Intolerable pain (NPRS > 7) level, 90% of them complain joint stiffness, more than half of them complain Physical limitation and Crackling sound when moving.

Also, this study agreement with Fear et al., [28] a study conducted in Turkey about "A Prevalence of hip problems in the population aged 55 years and over: access to specialist care and future demand for hip arthroplasty". Found that, the majority of studied sample reported pain and restrictions to physical activities. While nearly half for stiffness, sleep disturbance, Crackling sound when moving were reported as high prevalence symptoms in OA patients.

Regarding to treatment regimen of the elderly patient, the majority of them give drug treatment and less than half of them give Physical therapy, the study

agreement with Hawker et al., [29] the study conducted in China about "Determining the need for hip and knee arthroplasty: the role of clinical severity and patients' preferences" the study found that, the majority of study sample give drug treatment and less than half of them give physical therapy. From the investigator point of view that, the patients used multiple methods of treatment stated they would like to have additional drug treatment while making compresses, while the most of elderly patients stated they would like to have access to additional non pharmacological treatments to decreased the level of pain.

Regarding Body Mass Index (BMI), the current result illustrated that, more than half of the studied patients were obese ≥ 30 and little less than one-quarter of patients were at normal weight level, the study is in the same line with Melzer et al., [30], the study conducted in Americans about " Prevalence and distribution of hip and knee joint replacements and hip implants in older Americans by the end of life. The study found that, more than half of the studied patients were obese ≥ 30.

Also, With the same line the study of Ramadan et al., [31] the study conducted in Egypt about "evaluated the impact of physical exercise on the activities of daily living in women with early OA, recruited from the El-Demerdash University Hospital outpatient clinic, confirmed that, more than half of the patients surveyed were obese ≥ 30. which agreed with other study in assuit Abd Elfatah et al., [32] about "effect of cold application versus contrast hydrotherapy on patients knee osteoarthritis outcomes" in 180 patients at Assuit University Hospital in outpatients' orthopedic clinics. Who illustrated that, more than half of study subjects were obese patients

From the researcher point of viewthat, the obesity has negative effect in decrease bone mass especially on weight bearing bone and increase risk of OA, the primary risk factor for knee OA pain is high BMI. It can be attributed to the increased mechanical loading of the knee and hip from obesity and overweight, which is increasing damage to the cartilage of weight-bearing joints.

Answer research Q1: What is elderly patient's knowledge level related to osteoarthritis?

Regarding to the elderly patients knowledge, The results of this study demonstrated that, the majority of study sample incorrect knowledge regarding prevention of osteoarthritis and non pharmacological intervention of osteoarthritis that improve the pain. The study agree by LaValley et al., [33] the study conducted in USA about "Problems in the development and validation of questionnaire-based screening instruments for ascertaining cases with symptomatic knee osteoarthritis: the framingham study". Found that, the majority of study sample incorrect knowledge regarding prevention of osteoarthritis and non pharmacological intervention of osteoarthritis that improve the pain.

Regarding to the elderly patients knowledge, The results of this study demonstrated that, more than two thirds of the study sample incorrect knowledge

regarding complication and risk factors of osteoarthritis. While, less than half of them correct knowledge regarding symptoms of osteoarthritis. The study agree by Dillon CFRasch et al., [34] the study conducted in United States about "Prevalence of knee osteoarthritis in the United States: arthritis data from the Third National Health and Nutrition Examination Survey". The study found that, 65% of study sample incorrect knowledge regarding osteoarthritis. and 50% of study sample correct knowledge regarding symptoms of osteoarthritis. From The researcher point of view that, the elderly patient incorrect knowledge about the disease is due to the subjects were illitrate, low education and insuffecient income all of that main factors to poor knowledge.

Regarding elderly Patients total knowledge related to osteoarthritis, the current study revealed that, the majority of the study sample unsatisfactory knowledge regarding osteoarthritis. The study agree by Ingvarsson et al., [35] the study conducted in Pakistan about "Assessment of primary hip osteoarthritis: comparison of radiographic methods using colon radiographs". Found that, the majority of study sample unsatisfactory knowledge regarding osteoarthritis. From the researcher point of view that, most of the patients there are no available opportunities to attend workshops or raise awareness about the disease, theire lack of knowledge about the disease lead to occure complication and affect in different aspect of life especially sleep.

Answer research Q2 : What is pain level result from osteoarthritis?

Regarding total impact of pain among elderly patients in the study sample, the current study revealed that , more than half of them complain sever pain , On the other hand the study agree by Ayis & Dieppe [36]. The study conducted in Turkey about "The natural history of disability and its determinants in adults with lower limb musculoskeletal pain" the study found that, 75% of the study sample complain sever pain. Also, the study agreement by Srikanth et al., [37] a study conducted USA about "A meta-analysis of sex differences prevalence, incidence and severity of osteoarthritis" found that, 80% of elderly complain sever pain.

Also , with similarly study by Liu et al., [38] the study conducted in China about "who evaluated Sleep quality and covariates as predictors of pain intensity in 2052 participants from general population in rural areas in Liuyang, China "that demonstrated poor sleep in sample patients was associated with significantly increased pain intensity. The researher point of view, more efforts are needed to increase public awareness of the importance of improving sleep quality for pain prevention and management. Complementary therapies, such as breathing techniques to prepare for sleep, and slow or moderate exercise before sleep are useful and education on personal hygiene helps to set a healthy sleep–wake cycle among the general elderly for improved sleep quality.

Answer research Q3 : What is usual sleep quality of patients diagnosed with osteoarthritis?

Regarding the elderly patients sleep quality index (PSQI), the current study revealed that, .Less than half of them go to the bed from 8-10 am in the past month. In line with this study by Richter et al., [39], a study in Germany

“demonstrated that pre-post comparisons revealed a significant reduction of day-time sleepiness and depressive symptoms of the studied older adults”. the study found that 50% of them go to the bed from 8-10 am in the past month, Similarly in another German study conducted Gebhart et al., [40] revealed that, most of elderly go to the bed 8-12 am. In a more recent study, similar results have been found by Lovato et al., [41] who conducted their study in South Australia “to evaluate the efficacy of a brief treatment program of CBT for older adults”. The findings of this study indicated that, the most of elderly go to the bed in the midnight.

Regarding the elderly how long (in minutes) has it taken you to fall a sleep each night in the past month .More than half of elderly 1- 3 hours had it taken you to fall a sleep each night in the past months . In agreement with this, a study in Egypt conducted by Byomi and Sharkaway [42] to assess elderly knowledge and practice concerning sleep disturbance; to develop, implement and evaluate an educational training program about sleep disturbance, revealed that, more than half of the elderly 1- 4 hours had it taken you to fall a sleep each night. From the investigator point of view that, the majority of elderly complain of mood disturbances such as irritability, anger, depression, and anxiety causes the elderly taken time when sleep.

Regarding the elderly got up in the morning in the past month ,more than half of the elderly got up in the morning 5-7 am in the last months. This result is in agreement with the study carried out at Alexandria in Egypt by El Kady et al., [43], who mentioned that the majority of the studied elderly stated that got up in the morning 5-8 am.

Regarding the elderly how many hours of actual sleep do you get at night in the past month. Less than two thirds of elderly the actual sleep short < 6 hours/day every night in the past month. A study in Egypt conducted by Byomi and Sharkaway [42] to assess elderly knowledge and practice concerning sleep disturbance; to develop, implement and evaluate an educational training program about sleep disturbance”. Revealed that, 77% of elderly the actual sleep < 6 hours every day.

Regarding to elderly patients sleep latency, less than half of them the sleep latency less than 30-60 minutes .In line with this study by Escobar et al., [44] the study conducted in China about “Development of explicit criteria for total knee replacement”. Found that, 60% of the study sample the sleep latency less than 30 -60 minutes.

Correlations in the study

In the current study there was a relation between demographic characteristics of elderly patients and total knowledge. There was a statistically significant correlation between demographic characteristics of elderly patients and total knowledge of the study subjects and their educational levels, sex, marital status, place of residence, monthly income number of family members, occupational before retirement except age ($p \geq 0.001$). This finding is in line with the study of Ingvarsson [35] the study conducted in Iceland about “Prevalence and

inheritance of hip osteoarthritis in Iceland". Who indicated that there was a positive statistically significant correlation between socio demographic characteristics of elderly patients and total knowledge of the study, There was a statistically significant correlation between demographic characteristics of elderly patients and total knowledge of the study subjects and their educational levels, sex, marital status, place of residence, monthly income , number of family members , occupational before retirement except age (p≥0.001).

In the current study there was a relation between demographic characteristics of elderly patients, total sleep quality component as measured by PSQI. There was a shows a statistically significant correlation between demographic characteristics of elderly patients age, level of education, sex, marital status, place of residence, number of family members, occupational before retirement except monthly income and total sleep quality component as measured by PSQI. with p value (p=0.001*). This finding is in line with the study of Quintana et al., [45]. The study conducted in Turkism about "Evaluation of explicit criteria for total hip joint replacement. Who studied found that". It showed that there was a statistically significant correlation between socio demographic characteristics' of the study simple and their total sleep quality component as measured by PSQI elderly patients age, level of education, sex, marital status, place of residence, number of family members, occupational before retirement except monthly income and total sleep quality component as measured by PSQ with p value (p=0.001*).

In the current study there was a correlation between total sleep quality component as measured by PSQI, total scores of knowledge and pain. A statistically significant relation between total knowledge, sleep quality and pain with p value (p=0.001*). This finding is in line with the study of Ahlbäck [46] the study conducted in Pakistan about "Osteoarthrosis of the knee: a radiographic investigation" the study found that**,** a statistically significant relation between total knowledge, sleep quality and pain with p value (p=0.001*).

Conclusion

On the light of the results and answers on research qeustions the study was concluded that

Mostly of osteoarthritis patients had poor sleep quality according to PASQI regarding to subjective sleep quality, tim, latency,sleep duration, habitual sleep effeicacy, take the sleep drugs, daytime defects and use of medication, and the majority of females complain bad sleep All them complained pain and nearby two third has severe pain. So, pain significantly disturbed sleep quality in most of patients and had sleep difficulties (early morning, sleep onset latency and sleep to short duration).

The majority of elderly pateints had unsatisfactory knowledge about osteoarthritis regarding regarding prevention of osteoarthritis and non pharmacological intervention of osteoarthritis that improve the pain but som of them correct knowledge regarding symptoms of osteoarthritis. Additionally, there is a correlation between total sleep quality component as measured by PSQI , total

scores of knowledge and pain. A statistically significant relation between total knowledge, sleep quality and pain.

Recommendations

On the basis of the result of the study, the following recommendations' are suggested:

1- Continuous Health educational programms shoud be provided to all patients attending the orthopedic clinics to raise public awareness about osteoarthritis and provide guidance on non-pharmacological interventions to nocturnal pain cotrole and improve quality of sleep through: stimulus control, sleep restriction therapy, cognitive therapy, maintaining a regular sleep schedule and relaxation techniques.
2- Bookles, posters and illustrated handouts in arabic language with emphsis on pictures because of majority of elderly patients illetrate, it is containing simple information about OA and different methods of conrol the pain and improve sleep quality.
3- Further researches and educational activities are needed on a wide range particularly in the area of elderly's lifestyle changes to improve self-management and prevent sleep problems related to osteoarthritis.

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