

The Impact of Instructional Tips of Sleep Hygiene on Improving Sleeping Disorders and Physical Performance among Menopausal Women

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Abstract

Background: Menopausal women suffer from many sleep issues. Sleep disorders are now increasingly treated with non-pharmacological methods. **Aim:** This study aimed to investigate the impact of instructional tips of sleep hygiene on improving sleeping disorders and physical performance among menopausal women. **Design:** A quasi experimental (non-randomized control group) design was used. **Setting:** The study was conducted on women employees at Fayoum University who are in menopause. **Sample:** A purposive sampling of 100 menopausal women who met the inclusion criteria. **Tools:** Three tools were used: (1) Structured Interviewing Questionnaire, (2) The Pittsburgh Sleep Quality Index (PSQI) and (3) Work Productivity and Activity Impairment (WPAI) questionnaire. **Results:** The current study clarifies a highly statistically significant improvement in the total women's (PSQI) score and physical performance after implementation of the instructional tips of sleep hygiene where the (PSQI) score was better among study group than control group after post intervention and highly significant ($P < 0.000$). Additionally, there was a moderate positive correlation between post intervention sleep pattern and work productively where the degree of work productively increases with the decrease in the level of sleep disturbance (r test = 0.62). **Conclusion:** According to the study, the menopausal women in the study group who used the instructional tips of sleep hygiene saw a significant improvement in their physical activity levels and a decrease in their sleeping disorders. **Recommendation:** Developing and dissemination of illustrated guidelines included the instructional tips of sleep hygiene benefits to improve sleep disturbance and signs of menopause among menopausal women.

Keywords: Instructional Tips, Sleep Hygiene, Sleeping Disorders, Physical Performance, Menopausal Women.

Introduction:

Menopause is a natural biological phenomenon; nonetheless, physical symptoms like hot flashes and emotional manifestations may impair women's sleep, diminish energy levels, or impact emotional well-being. Menopause may occur due to the normal decline of reproductive hormones. The ovaries in women synthesize hormones, such as progesterone and estrogen, which govern the menstrual cycle. Women endure

cessation of menstruation, hot flushes, and other menopausal signs and symptoms (Dillaway, 2020).

Sleep disorders are neurological illnesses that alter sleep patterns. Sleep difficulties can adversely impact general health, workplace productivity, sexual function, overall quality of life, and safety. Sleep disorders are linked to a heightened risk of chronic diseases, diminished daily functioning, impaired mood, and decreased healthcare utilization (Salari et al., 2023).

Manifestations encompass intense daily sleepiness, abnormal respiration or heightened activity during sleep, an abnormal circadian rhythm, and challenges in initiating sleep. Uncommon or disturbed movements or sensations during sleep are also possible. A divergent sleep-wake cycle is an additional indication of sleep disorders **(Ballot et al., 2021)**.

Acute menopausal syndrome, including hot flashes and sleep disturbances, is the most prevalent gynecological issues during menopause. Menopausal women often experience disrupted sleep due to significant alterations in the biological systems linked to menopause, stemming from changes in ovarian shape and function. Establishing specific routines, such as maintaining a regular schedule and minimizing blue light exposure before to sleep, can enhance sleep hygiene and facilitate optimal sleep quality and bodily function efficiency **(Dillaway, 2020)**.

The "domino theory" proposes that vasomotor symptoms precipitate sleeplessness, subsequently resulting in the emergence of mood problems. Acute syndrome during menopause encompasses vasomotor phenomena and psychosomatic symptoms, which manifest variably across individuals based on their psychological, social, and cultural attributes. Acute diaphoresis accompanied by chills, palpitations, anxiety, sensations of pressure in the head and chest, nocturnal nausea, choking, and impaired attention typically contribute to sleep disorders and a decline in overall bodily function quality. Low sleep quality correlates with an elevated risk of depression **(Wang et al., 2022)**.

Non-pharmacological treatment modalities for sleep problems encompass sleep hygiene, sleep restriction therapy, stimuli control therapy, cognitive-behavioral therapy, and relaxation exercises. The most efficacious remedy for sleep disorders was fundamental sleep

hygiene practices. Sleep hygiene seeks to enhance understanding and awareness of healthy sleep practices and environmental influences, with the goal of cultivating new beneficial sleep hygiene behaviors. To this aim, menopausal women are educated about lifestyle and environmental influences, while nurses provide recommendations for improved sleep **(Saad El-Den et al., 2023)**.

Maternity and community nurses have played an essential part in promoting health by offering assistance and knowledge to women experiencing sleep disorders during post-menopause. Nurses can boost care quality, efficiently manage therapies to improve quality of life, and alleviate pain to prevent more diseases. The nurses should provide the patient time to articulate her feelings regarding her symptoms and care. Nurses must identify the factors that contribute to sleep disturbances in menopausal women and assess strategies to enhance sleep quality from a holistic perspective **(Pocira & Zangão, 2023)**.

Significance of the study:

Sleep disorders are prevalent complaints during menopause, affecting 40 to 69% of women **(Maki et al., 2024)**. Additionally, there is a heightened incidence of sleep-onset insomnia and a greater prevalence of obstructive sleep apnea. Hormonal changes alone are unlikely to fully elucidate the correlation between sleep disturbances and menopause. Insomnia in women may be attributable to hot flashes, mental problems, psychosocial variables, obstructive sleep apnea, restless legs syndrome, or other medical comorbidities **(Ozcan et al., 2021 & Abdel Razek et al., 2023)**.

The average age of menopause in Egypt is 46.7 years, which is significantly lower than that of many other countries. Nevertheless, this age has been increasing in recent years. The prevalence of menopausal-related symptoms in Egyptian women

exceeds that of their Western counterparts, likely due to varying sociocultural attitudes about menopause across different groups (Hassan & Abd El-Ghany, 2022). Egyptian women had limited knowledge regarding menopause. Menopause is a physiological process; comprehending its characteristics and symptoms can assist women in maintaining a high quality of life during this phase. There is a paucity of contemporary evidence regarding this problem in Egyptian literature (Shams-Eldin, 2018).

Sleep problems in menopause might cause disturbances in body function, daily activities, and psychological status. In general, it may lead to a change in quality of life. However, only a few studies have discussed ways to improve sleep during menopause. Thus, it is advised that women in menopause increase their awareness of sleep and sleep disorders and enhance their sleep hygiene practices (Hassan & Abd El-Ghany, 2022).

Aim of the Study:

The aim of this study was to investigate the impact of instructional tips of sleep hygiene on improving sleeping disorders and physical performance among menopausal women through :

- (1) Assessing sleeping disorders among menopausal women.
- (2) Assessing the body's functional performance among menopausal women.
- (3) Developing and implementing instructional tips of sleep hygiene for menopausal women, according to sleeping disorders and body function performance.
- (4) Evaluating the impact of instructional tips of sleep hygiene on improving sleeping disorders and physical performance among menopausal women.

Research Hypotheses:

H1: Menopausal women who utilize the instructional tips of sleep hygiene will have a significant improvement in sleeping disorders than those who don't .

H2: Menopausal women who utilize the instructional tips of sleep hygiene will have a significant improvement in body functional performance than those who don't.

Operational definitions:

Menopause: referred to as the permanent cessation of menstruation due to the loss of ovarian follicular function, determined retrospectively after a woman has experienced 12 months of amenorrhea without any identifiable physiological or pathological cause.

Sleep Hygiene Instructional Tips: Menopausal women in the study group have to adhere to a series of designed measures aimed at improving their sleep quality, which will in turn improve their daily life activities. Sleep hygiene encompasses education of typical sleep patterns, abstention from substance use, consistent physical activity, optimization of the bedroom environment, regulation of sleep and wake periods, and the avoidance of daytime napping.

I. Technical Design:

A. Research design:

A quasi experimental (non-randomized control group) design was utilized to fulfill the aim of the study.

B. Study Setting:

The study was conducted on women employees at Fayoum University who are in menopause, affiliated Fayoum University.

C. Sampling:

Sample type:

A purposive sample of 100 female employees was included in the study from the aforementioned environment.

The study sample was chosen based on the following criteria:

Inclusion criteria:

- Menopausal women aged 45:59 years.
- Women in menopause suffering from sleep disorders.
- Can read and write.

Exclusion criteria:

- Have psychiatric illnesses such as depression, anxiety or others.
- Taking sedative or hypnotic drugs.
- Have medical complications as heart, kidney, brain, or liver disease
- Have secondary insomnia caused by systemic diseases such as pain, cough, fever, external environment disturbances and surgery.
- Have taken hormones for more than or equal 6 months.

Sample size:

A purposive sample of 100 menopausal women was chosen based on this formula:

$$n = \frac{z^2 \times \hat{p}(1-\hat{p})}{\varepsilon^2}$$

Where n represent the sample size, z denote the z score, \hat{p} signify the population proportion, and ε indicate the margin of error. For a 95% confidence level, z equals 1.96. The population proportion \hat{p} is 0.071, and the margin of error ε is 0.05.

$$n = \frac{1.96^2 \times 0.068(1-0.071)}{0.05^2} = 100 \text{ menopausal women}$$

Sample technique:

The sample was randomly divided into two groups:

- **Control group** (n =50 menopausal women): did not receive the instructional tips of sleep hygiene or routine daily activity.
- **Study group** (n =50 menopausal women): received the instructional tips of sleep hygiene plus routine daily activity.

D.Tools for data collection: three main tools were used for data collection.

Tool I: A Structured Interviewing Questionnaire: This tool was designed by the researchers based on reviewing related literatures (Malik et al., 2021, Mohamed et al., 2022 & Abdel Razek et al., 2023), it consisted of three parts as follows:

Part (1): Women's demographic characteristics: it was consisted of (age, residence, educational level, nature of work and marital status).

Part (2): Women's signs and symptoms of menopause: to assess the signs and symptoms of menopause among the studied women including onset of menopause, clinical, psychological and urogenital signs after menopause.

Part (3): Women's causes of sleep disturbance after menopause: to assess the causes of sleep disturbance after menopause among the studied women such as vasomotor symptoms ,hormonal changes,mood and anxiety symptoms , restless legs syndrome, urogenital signs of menopause and the daily habits.

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

PSQI was adopted from (Manková et al., 2021). PSQI is an effective tool used to

measure the patterns and quality of sleep among women in menopause. It comprises 19 self-assessed items and seven professionally established areas of sleep disturbances over the preceding month. The PSQI produced seven domains pertaining to sleep behaviors, which include: First domain: Subjective sleep quality (SSQ) (one statement), Second domain: Sleep latency (SL) (two statements), Third domain: Sleep duration (1 Statement), Fourth domain: Sleep efficiency (SE), (three statements), Fifth domain: Sleep disturbance, (9 statements), Six domains: Use of sleeping medication (1 Statement), Seventh domain: Daytime dysfunction (2 statements).

Scoring system: Each of these seven domains scored from 0 to 3 with 0 indicating no difficulty and 3 indicating severe difficulty, which results in a global score which ranged from 0 to 21. Higher scores indicate worse sleep quality. The PSQI was categorized into four degrees of sleep quality.

-Good sleep quality (PSQI < 5) .

-Mild change in sleep quality (PSQI: 6 to 10) .

-Moderate impairment in sleep quality (PSQI: 11 to 15).

-Sever impairment in sleep quality (PSQI more than or equal 16).

Tool III: Work Productivity and Activity Impairment (WPAI) questionnaire:

The tool was developed from the research of (Zhang et al., 2010), which evaluated work productivity using the work Productivity and Activity Impairment (WPAI) questionnaire. The WPAI scale is a validated instrument employed to evaluate productivity loss in the work and impairment in daily activities. The questionnaire consists of two subscales: total work impairment and activity impairment, each ranging from 0 to 10, where higher scores indicate greater impairment.

Consider only how much PROBLEM affected
productivity while you were working.

PROBLEM had no effect on my work	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	PROBLEM completely prevented me from working
	0	1	2	3	4	5	6	7	8	9	10	

Absenteeism represents the percentage of work time missed due to health problems in the past 7 days:

$$\text{Absenteeism} = \frac{\text{Time missed from work}}{\text{Time missed from work} + \text{Time spent at work}} * 100\%$$

Presenteeism describes the proportion of work-related impairment attributable to health issues over the previous 7 days. This was evaluated with a Likert-type scale (range: 0–10); anchors: “health problems had no effect on my work,” and

“health problems completely prevented me from working,” respectively).

Activity impairment denotes the proportion of dysfunction in daily activities. The question posed to the participants was: “During the past seven days, how much did your health problems interfere with your ability to perform your regular daily activities, other than work at a job?” This was followed by items ranging from 0 to 10 and the anchors “health problems prevented me from doing my daily activities completely” and “health

problems had no effect on my daily

activities. The percentage was then calculated by multiplying the score by 10.

Consider only how much **PROBLEM** affected your ability to do your regular daily activities, other than work at a job.

PROBLEM had no effect on my daily activities

PROBLEM completely prevented me from doing my daily activities

0 1 2 3 4 5 6 7 8 9 10

SELECT A NUMBER

Tool validity:

A panel of five experts (three professors in Maternal and Neonatal Health Nursing and two professors in Community Health Nursing) evaluated the data collection tools for content validity, assessing clarity, relevance, comprehensiveness, understanding, and applicability. Feedback regarding the layout, format, and sequence of the questions was collected, and all remarks were appropriately acknowledged.

Tool reliability:

Reliability was estimated among the same sample of 10 menopausal women by using the test-retest method on two occasions and then compared the scores through SPSS computer package. The Cronbach's coefficient alpha result indicated that the questionnaire is reliable to detect the objectives of the study.

Reliability analysis

Tool	Alpha Cronbach	Internal consistency
II: The Pittsburgh Sleep Quality Index (PSQI).	0.91	Good
III: Work Productivity and Activity Impairment (WPAI) questionnaire.	0.89	Good

Ethical considerations:

The research was approved by the Scientific Ethical Committee at Fayoum University with ethical code (R 663). Before carrying out the study, the

researchers clarified the aim of the study and the expected outcomes to the menopausal women to gain mothers' trust and cooperation. The researchers guaranteed the privacy and confidentiality of the subjects' data. The menopausal women were informed of their option to participate in the study and their right to withdraw at any time.

II. Operational Design:

Pilot study:

A pilot study was carried out on 10 % of the total sample (10 employee women in menopause) to test the clarity and applicability of the study tools as well as estimation of the time needed to fill the tools and to find any challenges or barriers that needed to be addressed before using them. The pilot study showed that some items need to be added that help to achieve the study objectives and others needed to be modified, such as simplification and rephrasing of some questions to be simpler for understanding and other items need to be omitted. So, pilot study was excluded from the study sample later.

Field work:

- The study was conducted from beginning of June 2024 to December 2024 covering 6 months.
- The researchers visited the previously mentioned setting two days per week (Tuesday and Saturday) from 10.00 a.m. to 12.00 p.m.

- The women were interviewed in the offices rooms at the available times during the working day.
- The study was conducted through four phases: interviewing and assessment phase, planning phase, implementation phase, and evaluation phase.

I. Interviewing and assessment phase:

This phase entailed interviewing both the control group and the study group. Interviews commence with the control group to mitigate bias, followed by the study group. At the beginning of the interview the researchers greeted the women in menopause, introduced themselves, explained the purpose of the study and provided the women with all information about the study (purpose, duration, and activities) and took the informed consent to participate in the study. Data was collected by the researcher through the distribution of (Tool I: A structured self-administered questionnaire). Firstly, the researchers used (Tool I – Part 1,2and 3) to collect general characteristics and menopausal history then (Tool II) was used to select women in menopause with sleeping disorders. The Pittsburgh sleep quality index (Tool II pre-posttest) distributed to measure the quality and patterns of sleep during previous month. Average time for the completion of each woman interview was around (20-30 minutes). A number of interviewed women / days ranged from 1-4 women according to the number of women employees in offices who meet the previously mentioned criteria. The data collected in this phase served as the baseline for subsequent comparisons to assess the impact of instructional advice on sleep hygiene.

II. Planning phase :

- Based on results obtained from pretest assessment phase of studied women and review of relevant literature, the researchers designed the supportive

methods for the instructional tips of sleep hygiene in the following form:

- (A) Brochure that printed Arabic supported by figures for improving sleeping disorders.
- (B) Poster in Arabic to explain factors that increase insomnia and the instructional tips that improve the sleep.
- The session's numbers and its content were determined.

Objectives of instructional tips of sleep hygiene were constructed included the following :

- (A) **General objective:** By the end of the instructional sessions, each menopausal woman would be able to acquire the essential instructional tips related to the causes of sleep disorders and the tips of instructions to improve the sleep during menopause.
- (B) **Specific objectives:** By the end of the instructional sessions, each woman would be able to:
 - Define sleeping disorders.
 - Enumerate causes of sleeping disorders .
 - Illustrate types of sleeping disorders .
 - Discuss effect of sleeping disorders on body function .
 - Perform instructional tips of sleep hygiene.

III. Implementation phase:

- The researcher designed the instructional tips of sleep hygiene for the study group to overcome sleep disorders during menopause.
- The instructional tips of sleep hygiene were implemented through two sessions that were conducted in the offices rooms at the available times during working day immediately after completion of the assessment phase.
- Each session took about 30-45 minutes. The session is beginning with the instructional tips' contents.

- **The first session** included (definition, causes and types of sleeping disorders, effect of sleeping disorders on women in menopause).
- **The second session** after two weeks from first session included (how to resolve sleeping disorders through instructional tips of sleep hygiene as well as the components of routine care which included (warm shower, brush teeth, comfortable pajamas / sleep clothes, low light and warm drink (milk – herbs).
- Simple Arabic words were employed to accommodate women's comprehension levels.
- At the ending of each session, five minutes were allocated for women to pose questions, clarify session content, and rectify any misunderstandings.
- Each woman was notified of the schedule for the upcoming sessions.
- The sessions were conducted repeatedly until the specified sample size was achieved.
- Varying educational approaches were employed, including discussion, demonstration, and brainstorming.
- Instructional media included poster and brochure contain all content of the sessions and instructional tips about sleep disorders during menopause which constructed by the researchers after reviewing the related literatures were distributed to all recruited women in the study from the first session to achieve its objectives .

IV. Follow up and evaluation phase :

The effect of instructional tips of sleep hygiene on improving sleeping disorders and physical performance was evaluated by using posttest tools (tool II PSQI and tool III WPAI) after 2 weeks of instructions' implementation for both groups.

III. Administrative design :

An official approval letter to conduct this study was obtained from the Secretary General of Fayoum University, then the researchers interviewed each study participant and obtained an informed consent before starting the data collection .

IV. Statistical Analysis:

Data was verified prior to digital insertion. The Statistical Package for Social Sciences (SPSS version 22.0) was utilized for this purpose, followed by data tabulation and analysis. Descriptive statistics were employed, encompassing mean, standard deviation, frequency, and percentages. Significance tests, including the independent t-test and chi-square, as well as Pearson correlation coefficients, were utilized. A statistically significant difference is indicated by a p-value < .05, whilst a highly statistically significant difference is indicated by a p-value ≤ .001; a p-value > .05 suggests non-significant results.

Limitations of the study:

- Sometimes sessions were postponed in some offices due to work congestion.
- Sometimes the number of visits was increased during the week other than what was previously mentioned and the days of visits were changed to suit the available times to women employees.

Results:

Table (1) clarifies that, (52%) of control group and (44%) of the study group in age group from (45> 49 years) with a mean age 27.48 ± 5.53 and 27.24 ± 5.66 years respectively. Also, (66% and 76%) of both control and study groups respectively were lived in urban area. Concerning level of education, it was clear that (70% and 74%) of both control and study groups respectively had universal education. As regards

occupational status, (70% and 64%) of both control and study groups respectively were had light work nature (office works). Finally, (84% and 90%) of both control and study groups respectively live with partner. Generally, there was no statistically significant difference between control and study groups regarding demographic characteristics. That is the two groups under study homogenous .

Table (2) illustrates that, (44% and 54%) of both control and study group respectively had onset of menopause at age 45> 49 years while (68% and 64%) of both control and study group suffered of physical and mental exhaustion after the onset of menopause, there was no statistically significant difference between control and study groups regarding signs of menopause.

Figure (1) illustrates that, 92% and 98% of both control and study groups were suffering of vaginal dryness with no statistical significant between both groups (p- value 0.186).

Figure (2) illustrates that, 96% and 90% of both control and study groups had muscle and joint problems after menopause also; 82% and 84% of both control and study groups suffered of sleep change after onset of menopause with no statistical significant between both groups (p- value 0.651)(X^2 -2.510).

Table (3) clarifies that, 30% and 38% of both control and study groups respectively reported that; the causes of sleep disorder in menopausal age regarding vasomotor symptoms while; 38% and 32% of both control and study groups suffered of sleep disturbance due to restless legs syndrome with no statistical significant between both groups (p- value 0.91) (X^2 -0.20).

Table (4) reveals that, there was a highly statistically significant difference between mean of (PSQI) scoring among both study and control groups .The (PSQI) score was

better among study group than control groups after post intervention and highly significant ($P < 0.000$) in different items regarding the Pittsburgh sleep quality index while pre- intervention there is no a statistically significant difference between both control and study groups ($p = 0.92, 0.51, 0.86, 0.65, 0.71$).

Figure (3) clarifies that, there is highly statistical significance between of both control and study groups post intervention $P = (0.000^{**})$ while $X^2 = 41.2$ for the daytime physical dysfunction regarding sleep disorder among women in menopause with negative correlation between study group post intervention and the daytime physical activities means that decrease sleep disturbance leads to improve the daytime physical activities.

Table (5) indicates that, there was a highly statistical significant and negative correlation between study and control group post – intervention that means decrease sleep disturbances of studied women is associated with increase productivity of working the ability to do regular daily activities and work at a job .

Table (6) illustrates that, there is a moderate positive correlation between post intervention sleep pattern as (sleep duration) and work productively. The degree of work productively increases with the decrease in the level of sleep disturbance (r test =0.62).

Table (1): Frequency Distribution of the Studied Women in the Study and Control groups According to Their Demographic Characteristics (n= 50):

General characteristics	Control group N=50		Study group N=50		X ²	p-value
	no	%	No	%		
(Age) years						
45> 49	26	52%	22	44%	1.567	0.457
50> 54	17	34%	23	46%		
55> 59	7	14%	5	10%		
Mean ± D S	50.1± 3.6		50.3 ± 3.3			
Residence						
Rural	17	34%	12	24%	0.10	0.45
Urban	33	66%	38	76%		
Level of education						
Read and write	4	8%	2	4%	1.16	0.76
Diplom	5	10%	7	14%		
University education	35	70%	37	74%		
Postgraduate education	6	12%	4	8%		
Nature of work						
Heavy work	15	30%	18	36%	0.34	0.55
light work	35	70%	32	64%		
Marital status						
With a partner	42	84%	45	90%	1.74	0.18
Without a partner	8	16%	5	10%		

Table (2): Frequency Distribution of the Studied Women in the Study and Control groups According to Their Signs and Symptoms of Menopause (n= 50):

Signs of menopause	Control group N=50		Study group N=50		X ²	p-value
	No	%	No	%		
Onset of menopause:						
45> 49	22	44%	27	54%	1.017	0.601
50> 54	19	38%	16	32%		
55> 59	9	18%	7	14%		
Mean ± SD	50.7± 3.8		50.1± 3.6			
Clinical signs after menopause:						
Mood swing.	35	70%	42	84%	2.510	0.651
Change in appetite.	15	30%	12	24%		
Change in libido.	39	78%	45	90%		
Dyspareunia.	29	58%	32	64%		
Alopecia.	12	24%	7	14%		
Sleep change.	41	82%	42	84%		
Shortness of breath, sweats, and hot flashes.	48	96%	50	100%		
Heart racing or pounding.	42	84%	39	78%		
Insomnia/difficulty sleeping.	40	80%	43	86%		
Muscle and joint problems.	48	96%	45	90%		
Psychological signs after menopause:						
Depressive mood.	10	20%	7	14%	0.101	0.750
Irritability.	22	44%	26	52%		
Anxiety.	17	34%	20	40%		
Physical and mental exhaustion.	34	68%	32	64%		
Urogenital signs after menopause:						
Vaginal dryness.	46	92%	49	98%	0.101	0.750
Urine leakage.	18	36%	10	20%		
Bladder problem.	32	64%	19	38%		
Sexual problem.	12	24%	24	48%		

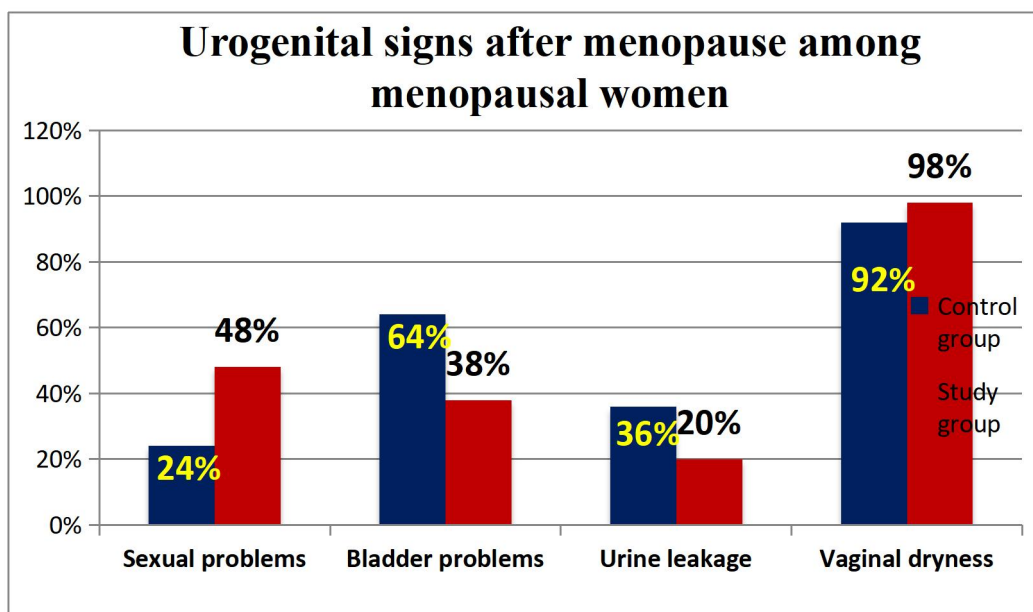


Figure (1): Frequency Distribution of the Studied Women in the Study and Control groups According to Their Urogenital Signs after Menopause (n= 50)

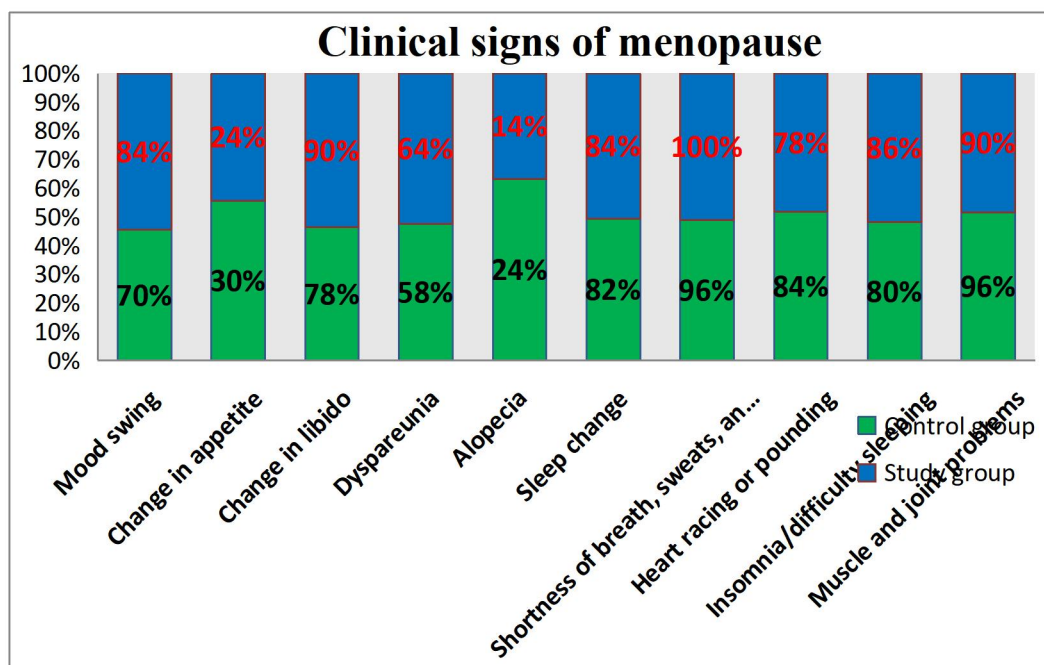


Figure (2): Frequency Distribution of the Studied Women in the Study and Control groups According to Their Clinical Signs after Menopause (n= 50):

Table (3) Causes of Sleep Disturbance among the Studied Women in the Study and Control groups (n= 50):

Causes of Sleep Disturbance among menopausal women.	Control group N = 50		Study group N =50		X ² p-value
	No	%	No	%	
Vasomotor symptoms.	15	30%	19	38%	0.20 0.91
Hormonal change.	2	4%	3	6%	
Mood and anxiety symptoms.	6	12%	4	8%	
Restless legs syndrome.	19	38%	16	32%	
Urogenital signs of menopause.	3	6%	1	2%	
Daily habits.	5	10%	7	14%	
Total	50	100%	50	100%	

Table (4): The Pittsburgh Sleep Quality Index (PSQI) among the Studied Women in the Study and Control groups Pre and Post Implementation of the Instructional Tips of Sleep Hygiene (n = 50).

Sleep quality items	Pre- intervention				X ² P- value	Post-intervention				X ² P –value
	Control group N = 50		Study group N =50			Control group N = 50		Study group N = 50		
	No	%	No	%		No	%	No	%	
Subjective sleep quality.										
Without sleep disorder.	4	8%	4	8%	0.49	4	8%	8	16%	21.9 0.000 **
Mild sleep disorder.	22	44%	23	46%		19	38%	27	54%	
Moderate sleep Disorder	20	40%	20	40%		23	46%	12	24%	
Severe sleep disorder.	4	8%	3	6%		4	8%	3	6%	
Sleep latency										
Without sleep disorder.	2	4%	1	2%	1.2 0.51	1	2%	0	0%	17.5 0.002**
Mild sleep disorder.	32	64%	28	56%		28	56%	35	70%	
Moderate sleep Disorder	15	30%	18	36%		19	18%	14	28%	
Severe sleep disorder.	1	2%	3	6%		2	2%	1	2%	
Sleep Duration.										
Without sleep disorder.	6	12%	5	10%	0.41 0.86	6	12%	8	16%	15.2 0.000**
Mild sleep disorder.	28	56%	29	58%		28	56%	34	68%	
Moderate sleep Disorder	13	26%	11	22%		10	30%	4	8%	
Severe sleep disorder.	3	6%	5	10%		6	12%	4	8%	
Sleep efficiency.										
Without sleep disorder.	3	6%	2	4%	1.5 0.65	3	6%	6	12%	39.5 0.000**
Mild sleep disorder.	15	30%	9	18%		11	22%	28	56%	
Moderate sleep Disorder	21	42%	31	62%		33	66%	10	30%	
Severe sleep disorder.	11	22%	8	16%		13	26%	6	12%	
Sleep Disturbance.										
Without sleep disorder.	1	2%	1	2%	0.93 0.71	2	4%	9	18%	46.0 0.000**
Mild sleep disorder.	11	22%	7	14%		10	20%	21	42%	
Moderate sleep Disorder	17	34%	27	54%		14	28%	14	28%	
Severe sleep disorder.	21	42%	15	30%		24	48%	6	12%	
Daytime physical Dysfunction.										
Without sleep disorder.	6	12%	4	8%	2.3 0.50	4	8%	8	16%	41.2 0.000**
Mild sleep disorder.	25	50%	22	44%		23	46%	31	62%	
Moderate sleep Disorder	18	36%	19	38%		21	42%	10	20%	
Severe sleep disorder.	1	2%	5	10%		2	4%	1	2%	

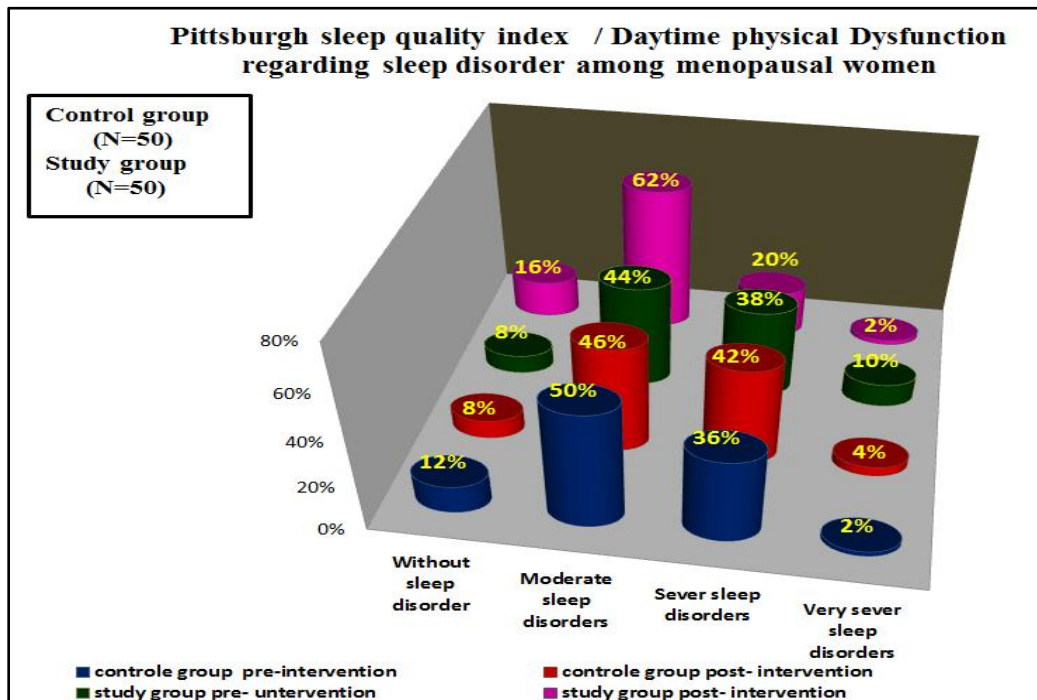


Figure (3): Daytime physical Dysfunction Regarding Sleep Disorder among the Studied Women in the Study and Control groups Pre and Post Implementation of the Instructional Tips of Sleep Hygiene (n = 50).

Table (5) Effect of Sleep Pattern on Work Productivity and Daily Activities Pre & Post Implementation of the Instructional Tips of Sleep Hygiene among Menopausal Women in the Study and Control Group (n= 50).

Sleep quality items	Pre- Intervention				X ² p-value	Post- Intervention				X ² p-value
	Control group N = 50		Study group N =50			Control group N = 50		Study group N = 50		
	No	%	No	%		No	%	N o	%	
Effect of sleep disorder on productivity of working.										
No affect /high productivity.	11	22%	9	18%		10	20%	13	26%	
Mild affect/ Mild productivity.	18	36%	20	40%	0.21	16	32%	25	50%	27.2
Moderate affect / moderate productivity.	20	40%	18	36%	0.92	22	44%	11	22%	0.001 **
Sever affect / no productivity.	1	2%	3	6%		2	4%	1	2%	
Effect of sleep disorder on the ability to do regular daily activities and work at a job.										
No affect / high regular daily activities.	6	12%	8	16%	0.92	6	21%	15	30%	19.7
Mild affect /mild regular daily activities.	15	30%	18	36%	0.71	13	26%	24	48%	0.002**
Moderate affect / moderate regular daily activities.	22	44%	18	36%		23	46%	10	20%	
Sever affect/ no regular daily activities.	7	14%	6	12%		8	16%	1	2%	

Table (6): Correlation between Sleep Duration, Efficiency and Work Productively in Post Intervention among Menopausal Women.

Effect of sleep disorder on productivity of working in study group.	Sleep duration after intervention in study group								Total (No = 50)	r Test
	Without sleep disorder n = 8		Mild sleep disorder n = 34		Moderate sleep disorder n=4		Sever sleep disorder n=4			
	No	%	No	%	No	%	No	%		
Items										
High productivity.	7	87.5%	6	17.6%	0	0.0	0	0.0	13	0.62
Mild productivity.	1	12.5%	23	67.6%	1	25%	0	0.0	25	
Moderate productivity.	0	0.0	5	14.7%	3	75%	3	75%	11	
No productivity.	0	0.0	0	0.0	0	0.0	1	25%	1	
Total	8	100%	34	100%	4	100%	4	100%	50	

Discussion:

The present study aimed to investigate the impact of instructional tips of sleep hygiene on improving sleeping disorders and physical performance among menopausal women. The present study results showed that there was a significant improvement in the quality and pattern of sleep among the study group following the application of instructional tips of sleep hygiene. Also, there was an improvement in the physical performance outcome among the study group compared to the control group. The current study's findings provided strong support for the research hypotheses.

As regards general characteristics of studied women, the current study's findings clarified nearly half of the study group and over half of the control group were between the ages of 45 and 49, with mean ages of 50.1 ± 3.6 and 50.3 ± 3.3 years, respectively of women in menopause. These findings were agreed with a study by **Abdel Razek et al. (2023)** that entitled "Effect of Back Message on Sleep Pattern among Menopausal Women" who reported that the mean age of the menopausal women was 53.02 ± 3.04 years.

As regards occupational status, more than two-thirds of both the control and study groups respectively had a light work nature (office work). These findings agreed with **O'Neill et al. (2023)**, who studied "Impact of menopausal symptoms on work and careers" and reported that the largest percentage of the studied sample had light work.

Concerning the level of education, it was clear that more than two-thirds of both the control and study groups, respectively had universal education. These results of the current study were consistent with **Drake et al. (2019)**, who studied "Treating chronic insomnia in postmenopausal women: a randomized clinical trial comparing cognitive-behavioral therapy for insomnia, sleep restriction therapy, and sleep hygiene education" and revealed that more than two-thirds were holding universal certificates. On the other hand, the results of the current study were in disagreement with **Kalmbach et al. (2019)**, who studied "Improving Daytime Functioning, Work Performance, and Quality of Life in Postmenopausal Women with Insomnia: Comparing Cognitive Behavioral Therapy for Insomnia, Sleep Restriction Therapy, and Sleep Hygiene Education" and reported that the majority of the participants had a diploma degree.

The results of the current study showed that nearly half and half of both the control and study group respectively had onset of menopause at age 45 <49 years. These findings were agreed with a study by **Ceylan & Ozerdogan (2024)**, that entitled "Factors affecting age of onset of menopause and determination of quality of life in menopause." who demonstrated that the majority of the studied sample had onset of menopause at age 45- 49 years. This may be due to a group of physiological factors that occur during this age, as age of menarche, body mass index, number of pregnancies, and physical activities.

The results of this study demonstrated that the majority of both the study and control groups, respectively had mood and libido changes as a sign of menopause, as well as the majority of both the control and study groups, respectively had insomnia and difficulty sleeping after menopause. Regarding menopausal symptoms and sleep patterns, there was no statistically significant difference between both the study and control groups. The researchers believe that this can be the result of inadequate sleep hygiene practices, such as engaging in vigorous physical activity, maintaining irregular bedtimes, retiring without a sensation of sleepiness, and participating in stimulating activities prior to sleep (such as viewing thrilling films), disrupting sleep rhythms and resulting in diminished sleep quality.

The current results were agreed with a study by **Zolfaghari et al. (2020)** that entitled "Effects of menopause on sleep quality and sleep disorders" who reported that menopause is linked to an increase in sleep-onset insomnia in the majority of the studied sample. However, the present results are not consistent with the results of **Maki et al. (2024)**, who studied " Sleep disturbance associated with the

menopause" and reported that more than two-thirds of midlife women report sleep disturbance; however, a much smaller proportion of women (usually between 4% and 40%) meet the criteria for a diagnosis of insomnia.

As regards the women's sleep quality, the findings of the post-intervention phase revealed that there was a highly statistically significant difference between both the control and study groups regarding the quality and pattern of sleep and physical activity in favor of the study group. From the researchers' point of view, this improvement in the sleep pattern as well as physical activities is may be due to educating the menopausal women about the instructional tips of sleep hygiene, which improve sleep quality and how to deal with sleep problems through organized sessions and by applying these instructions with a study group.

These findings were supported by **Ha et al. (2023)**, who studied "Effects of Non-pharmacological Interventions on Sleep Quality and Insomnia in Perimenopausal and Postmenopausal Women: A Meta-Analysis" and found that the non-pharmacological interventions including sleep hygiene practices, had a favorable impact on menopausal women's sleep quality as assessed by the PSQI ($p < 0.001$) and the severity of their insomnia after intervention compared with the control groups. Also, these findings were in the same line with **Shi et al. (2024)**, who studied "Knowledge, attitude, and practice toward sleep disorders and sleep hygiene among menopausal women" and showed positive correlations between sleep quality and sleep hygiene practices.

In relation to the Pittsburg Sleep Quality Index (PSQI) score, the findings showed that there was a highly statistically significant difference between the mean PSQI scores for the study and control

groups. The (PSQI) score was better among the study group than the control group after the post-intervention of the instructional tips of sleep hygiene and highly significant ($P < 0.000$). These findings of the present study agreed with **Otte et al. (2015)**, who found that there were significant associations between sleep quality index in menopausal women pre- and post-sleep hygienic intervention.

Concerning the physical performance and work productivity, the findings of the current study showed that there was a positive correlation between sleep quality improvement and work productivity and daily activity. These findings agreed with **Kagan et al. (2021)**, who studied "Impact of sleep disturbances on employment and work productivity among midlife women in the US SWAN database: a brief report" and revealed that the poor sleep quality group combined with poor work productivity and regularity, while the good sleep quality group and improvement after intervention improved the regularity and productivity with high statistical significance between both groups after intervention. This suggests that sleep disorders are a contributing factor to decreased productivity and decreased occupational function among workers in general.

Furthermore, the current study's findings supported by **Kalmbach et al. (2019)**, who discovered that women with the shortest sleep duration and disturbance of sleep suffered from irregular daytime activity. This indicating that poorer self-ratings of work performance and higher absenteeism were linked to increased sleep difficulties.

Finally, the researchers believe that this is a reflection of the recent trend of expanding access to the non-pharmacological interventions because the pharmacological interventions carry risks, such as drug interactions, the suppression of rapid-eye-

movement sleep, drug abuse, and long-term side effects like difficulty quitting due to psychological and physical dependence. For this reason, researchers must work to offer safe intervention choices for expanding the future practical usage of non-pharmacological intervention.

Conclusion:

Applying the instructional tips of sleep hygiene had a significant improvement in sleeping disorders and positive physical activity outcomes among menopausal women of study group. Moreover, there was a highly statistically significant positive correlation between menopausal women's quality of sleep and their daytime activities and work productivity, where good quality of sleep reflected on the outcome of physical activity and signs of menopause. Hence the aim of the study was achieved, and the study hypotheses were accepted.

Recommendations:

- Instructional tips of sleep hygiene as non-pharmacological alternative methods are recommended, which can be applied in different ages of women's lives.
- Developing and dissemination of illustrated guidelines included instructional tips of sleep hygiene benefits to improve sleep disturbance and signs of menopause among menopausal women.
- Preparing training programs for nurses regarding the instructional tips of sleep hygiene at maternity units and departments.
- Emphasis on the importance of applications for instructional tips of sleep hygiene among menopausal women with sleeping disorders through workshops and awareness sessions.
- Further researches of instructional tips of sleep hygiene to relieve sleeping disorders for females out of menopausal age.

References:

- Abdel Razek, D., Omran, A., Salama, A., & Hassan, M. (2023).** Effect of Back Message on Sleep Pattern among Menopausal Women. *Journal of Nursing Science - Benha University*; 4 (2):274- 286. ISSN 2682 – 3934.
- Ballot, O., Ivers, H., Ji, X., & Morin, C. M. (2021).** Sleep Disturbances during the Menopausal Transition: The Role of Sleep Reactivity and Arousal Predisposition. *Behavioral Sleep Medicine*. 20(4):1-13.
- Ceylan, B., & Ozerdogan, N. (2024).** Factors affecting age of onset of menopause and determination of quality of life in menopause. *Journal of Turkish Society of Obstetrics and Gynecology*; 12: 43-49.
- Dillaway, H. (2020).** Living in Uncertain Times: Experiences of Menopause and Reproductive Aging. *The Palgrave Handbook of Critical Menstruation Studies* [Internet]. Singapore: Palgrave Macmillan; 2020. Chapter 21. PMID: 33347184, Bookshelf ID: NBK565637. DOI: 10.1007/978-981-15-0614-7_21.
- Drake, C.L., et al. (2019).** Treating chronic insomnia in postmenopausal women: a randomized clinical trial comparing cognitive-behavioral therapy for insomnia, sleep restriction therapy, and sleep hygiene education. *Sleep Research Society*; 42(2):zsy217. Doi: 10.1093/sleep/zsy217. PMID: 30481333; PMCID: PMC6369725.
- Ha, B., Kim, J., So, W., & Kim, S. (2023).** Effects of Non-pharmacological Interventions on Sleep Quality and Insomnia in Perimenopausal and Postmenopausal Women: A Meta-Analysis. *Healthcare (Basel)*; 11(3):327. Doi: 10.3390/healthcare11030327. PMID: 36766902; PMCID: PMC9914174.
- Hassan, L., & Abd El-Ghany, G. M. (2022).** Quality of Life among Postmenopausal Women in Beni Suef University Hospital. *Port Said Scientific Journal of Nursing*; 9(2): 269-287. Doi: 10.21608/pssjn.2022.90532.1137.
- Kagan, R., Shiozawa, A., Epstein, A.J. & Espinosa, R. (2021).** Impact of sleep disturbances on employment and work productivity among midlife women in the US SWAN database: a brief report. *Menopause*; 28(10):1176-1180. Doi: 10.1097/GME.0000000000001834. PMID: 34469936; PMCID: PMC8462448.
- Kalmbach D.A et al., (2019).** Improving Daytime Functioning, Work Performance, and Quality of Life in Postmenopausal Women with Insomnia: Comparing Cognitive Behavioral Therapy for Insomnia, Sleep Restriction Therapy, and Sleep Hygiene Education. *Journal of Clinical Sleep Medicine*; 15(7):999-1010. Doi: 10.5664/jcsm.7882. PMID: 31383238; PMCID: PMC6622507.
- Maki, P.M., Panay, N., & Simon, J.A. (2024).** Sleep disturbance associated with the menopause. *The Journal of the Menopause Society*; 31(8):724-733. Doi: 10.1097/GME.00000000000002386. Epub 2024 Jun 25. PMID: 38916279.
- Mohamed, M., Hafez, E., Ebeid, I., & Elalem, O. (2022).** Prevalence of complementary and alternative medicine use and its associated factors among menopausal women in Egypt. *International Egyptian Journal of Nursing Sciences and Research*; 3(1):455-469.
- Manková, D., Dudysová, D., Novák, J., Fárková, E., Janků, K., Kliková, M., & Kopřivová, J. (2021).** Reliability and Validity of the Czech Version of

- the Pittsburgh Sleep Quality Index in Patients with Sleep Disorders and Healthy Controls. *BioMed Research International*.
- Malik, M., Hussain. A., & Hashmi, A. (2021).** Health promoting lifestyle behaviors and sleep quality among post-menopausal women in Pakistan. *Systematic Reviews in Pharmacy*; 12(8): 2934-2940.
- O'Neill, M.T, Jones, V., & Reid A. (2023).** Impact of menopausal symptoms on work and careers: a cross-sectional study. *Occup Med (Lond)*. 2; 73(6):332-338. Doi: 10.1093/occmed/kqad078. PMID: 37542726; PMCID: PMC10540666.
- Özcan, H., Çakmak, S., & Salman, E. (2020).** Complementary and Alternative Medicine Methods Used for Sleep Disturbance in Menopause, *Journal of Turkish Sleep Medicine*, 3(1): 207-213.
- Otte, J.L., Rand, K.L., Landis, C.A., Paudel, M.L., Newton, K.M., Woods, N., & Carpenter, J.S. (2015).** Confirmatory factor analysis of the Pittsburgh Sleep Quality Index in women with hot flashes. *Menopause*; 22(11):1190-6. Doi: 10.1097/GME.0000000000000459. PMID: 25944520; PMCID: PMC4624473.
- Poeira, A. F., & Zangão, M. O. (2023).** Improving Sleep Quality to Prevent Perinatal Depression: The Obstetric Nurse Intervention. *International Journal of Translational Medicine*; 3(1): 42-50. <https://doi.org/10.3390/ijtm3010004>.
- Shi, X., Shi, Y., Wang, J., Wang, H., & Li, Y. (2024).** Knowledge, attitude, and practice toward sleep disorders and sleep hygiene among perimenopausal women. *Scientific Reports*; 14, 11663. Available at <https://doi.org/10.1038/s41598-024-62502-4>.
- Salari, N., et al. (2023).** Global prevalence of sleep disorders during menopause: a meta-analysis. *Sleep Breath*; 27(5):1883-1897. Doi: 10.1007/s11325-023-02793-5. Epub 2023 Mar 9. PMID: 36892796; PMCID: PMC9996569.
- Saad El-Den, A., El-Shiekh, M., Mohammed, A., & Ali, F. (2023).** Effectiveness of Instructional Tips of Sleep Hygiene in Improving Sleeping Disorders of Pregnant Women and their Effect on the Outcome of Pregnancy. *Journal of Nursing Science Benha University*; 4(2): 85-105. Doi: 10.21608/jnsbu.2023.322584.
- Shams-Eldin, A.A. (2018).** Knowledge, Attitude and Severity of Menopausal Symptoms among Women Attending Primary Health Care Centers in Cairo, Egypt. *Al-Azhar Medical Journal*; 47(2), 423-434. Doi: 10.12816/0052265.
- Wang, S., et al. (2022).** Associations of Depression, Anxiety, Worry, Perceived Stress, and Loneliness Prior to Infection with Risk of Post-COVID-19 Conditions. *JAMA Psychiatry*; 79(11):1081-1091. Doi: 10.1001/jamapsychiatry.2022.2640. PMID: 36069885; PMCID: PMC9453634.
- Zolfaghari, S., et al. (2020).** Effects of menopause on sleep quality and sleep disorders: Canadian Longitudinal Study on Aging. *Menopause*; 27(3):295-304. Doi: 10.1097/GME.0000000000001462. PMID: 31851117.
- Zhang, W., Bansback, N., Boonen, A., Young, A., Singh, A., & Anis, A.H. (2010).** Validity of the work productivity and activity impairment questionnaire--general health version in patients with rheumatoid arthritis. *Arthritis Res Ther*; 12(5):R177. Doi: 10.1186/ar3141. Epub 2010 Sep 22. PMID: 20860837; PMCID: PMC2991008.