

Sleep Quality Among Post-Menopausal Women

Fayrouz Said Ahmed Roshdy¹, Eman Shokry Abd Allah², and Naemia Mohammed Elsayed Ahmed³

(¹) Clinical instructor of Gerontological Nursing, Faculty of Nursing at Zagazig University, (²) Professor of Community Health Nursing and Gerontological Nursing, Faculty of Nursing at Zagazig University, & (³) Assistant professor of obstetrics and gynecological Nursing, Faculty of Nursing, Zagazig University

Abstract

Background: Sleep disorders are common in postmenopausal women and are linked to poor physical and mental health. **Aim of the study:** To assess sleep quality among postmenopausal women. **Subjects and Methods:** **Research design:** A descriptive design was utilized. **Setting:** Study was conducted at Kafr Badran village in Sharqia Governorate. **Subjects:** Purposive sample composed of 120 postmenopausal women aged 55-65 years. **Tools of data collection:** Two tools were used to collect the study data; Tool I: A structured interview questionnaire consisted of three parts; Part one: Demographic characteristics of the studied postmenopausal women, Part two: Menstrual, obstetrical, gynecological and contraceptive history of the woman; Part three: Women knowledge regarding menopause. Tool II: Health Promotion Lifestyle Profile. **Results:** 90% of studied postmenopausal women had unsatisfactory level of knowledge about the menopause and 55% of the postmenopausal women had poor sleep quality. **Conclusion:** There was no a statistically significant relation between knowledge and sleep quality. **Recommendations:** Educational consultation interventions to improve the quality of sleep in postmenopausal women as well as the development of preventive and treatment strategies to relieve sleep disorders for these women.

Keywords: Sleep Quality, Post-Menopausal, Women

Introduction

Post-menopause is a critical period due to a series of changes that are caused by the decline of production of estrogens by the ovaries that lead to low estrogen levels. The number of postmenopausal women has been increasing in recent years due to the increase of life expectancy. Nowadays, most women spend more than one-third of their life beyond their menopause⁽¹⁾.

Postmenopausal women present with sleep difficulties with a higher frequency than younger women. During the postmenopausal, poor sleep and insomnia are reported by 40%-60% of women, is characterized by difficulties falling asleep and/or sustaining sleep, resulting in poor quality of life when these become severe. Poor sleep quality decreases general health quality and is associated with physical and psychological problems⁽²⁾.

Sleeping is one of fundamental human needs and as adults spend about one third of their life on sleeping, the disorders relevant to quantity and quality of sleep can have significant effect on quality of life of individuals⁽³⁾. The term sleep quality is commonly used in sleep medicine and can refer to a collection of sleep measures including total sleep time, sleep onset latency, sleep maintenance, total wake time, sleep efficiency, and sometimes sleep disruptive events such as spontaneous arousal or apnea⁽⁴⁾.

A number of factors affect the quality and quantity of sleep. Often more than one factor combined to cause a sleep problem: aging, menopause-specific factors, physical illness (e.g. nausea, mood disorders, breathing difficulty, pain), drugs and substances (e.g. Tryptophan), lifestyle (e.g. daily routines, exercises), cultural factors, usual sleep patterns and excessive daytime sleepiness, emotional stress, environment

(ventilation), sound, exercise and fatigue, food and caloric intake ⁽⁵⁾.

Hormonal changes in the postmenopausal period can contribute to sleep disorders. Particularly; low levels of estrogen cause a reduction in melatonin and serotonin levels, which are essential for sleep. Hot flushes have also been reported to be associated with poor sleep quality ⁽⁶⁾.

Gerontological nurses have an important role in supporting patients' sleep therefore, it is vital to evaluate patients' sleep quality and define which nursing interventions can promote the quality of sleep. Patients' perceptions on how to promote sleep may give new insights into the problem, as many factors affecting quality of sleep are highly personal, such as patients' condition, sleep habits and the anxiety level ⁽⁷⁾. Gerontological nurse can also promote the quality of sleep in postmenopausal women by application of non-pharmacological procedures such as warm foot baths that can raise blood circulation and peripheral temperature without changing the core temperature, resulting in facilitating sleep onset and improving sleep quality ⁽⁸⁾.

Significance of the study:

Globally, it is estimated that women will now spend one-third of their life span in postmenopausal stage and number of post-menopausal women will reach 1.1 billion by 2025. Therefore, postmenopausal is currently an alarming subject to sustain and enrich women's health ⁽⁹⁾. One of the most common reasons for referring postmenopausal women to health care facilities and using tranquilizers is sleep disorders. The prevalence of sleep disorders ranges from 28 to 63%, and approximately one-third of postmenopausal women suffer from sleep disturbances, including difficulty falling asleep and or maintaining sleep resulting in somnolence and fatigue during the day ⁽¹⁰⁾.

Aim of the study:

The current study aimed to assess sleep quality among post-menopausal women.

Research Questions:

1. What is the knowledge of post-menopausal women about menopause?
2. What is the sleep quality among post-menopausal women?

Subjects and methods:

Research design:

A descriptive design was used to conduct this study.

Study setting:

The study was conducted at Kafr Badran which was randomly selected from 82 village of Minya El-Qamh districts which also was selected from the 21 districts of Sharkia governorate.

Study subjects:

A purposive sample of 120 postmenopausal women from the above-mentioned setting who fulfilled the following criteria: age: 55 -65 years, women who had natural menopause, free from any medical disorders as hypertension, diabetes mellitus and thyroid disease, able to communicate.

Sample size calculation:

The sample size was calculated based on assuming the prevalence of health promotion lifestyle among post -menopausal women was 44, 1% ⁽¹¹⁾.and The number of post-menopausal women in Kafr Badran village in Minya El-Qamh District, Sharkia Governorate was 178 women ⁽¹²⁾.using software EPI- Info Package, with confidence 95% and power of the test 80%, the sample size was calculated to be 120 women.

Tools of data collection:

Two tools were used to collect necessary data. **Tool I: a structured interview questionnaire** which consisted of three parts;

Part (1): This part was used to assess demographic characteristics of

the studied postmenopausal women; which included age, marital status, educational level, current working, monthly income and living condition, in addition to measure body mass index.

Part (2): This part was covered menstrual, obstetrical, gynecological and contraceptive history of the woman as age at menopause, onset of menopause, length of menopause, number of parity, mode of delivery, contraceptive usage and contraceptive type.

Part (3): This part was intended to assess postmenopausal women's knowledge about menopause as (definition of menopause, causes of menopause, symptoms of menopause and the treatment for postmenopausal period, as well as women's previous information about menopause and the source of this information. For knowledge items, a score (2) was given when the answer was completely correct, a score (1) was given when the answer was incompletely correct and a score (0) was given when the answer was wrong or don't know. The total knowledge score was ranged from 0-12. The knowledge scores were depending on the numbers of grades the participant obtained regarding all questions. The total grade was computed out of twelve (12) grades and knowledge was considered satisfactory if the percent score was 60% or more (≥ 6 grades) and unsatisfactory if less than 60% (< 6 grades).

Tool II: The Pittsburgh Sleep Quality Index (PSQI) ⁽¹³⁾:

This tool was 19-item self-report questionnaire. It designed to measure sleep quality and disturbances over a one month period. The first PSQI items ask respondents for their usual bedtime, length of time to fall asleep, usual wake-up time, and duration of actual sleep. The rest of the 15 Likert-type items inquire about the frequency of sleep disturbances and subjective sleep quality within the past month. It basically has 9 items, but the fifth

question contains 10 sub-items and items are scored based on a 4-point Likert scale from 0 to 3.

This questionnaire has 7 subscales which include: subjective sleep quality (item 6), sleep latency (item 2 and 5a), sleep duration (item 4), habitual sleep efficiency (items 1, 3 and 4), sleep disturbances (items 5b to 5j), use of sleep medications (item 7), and daytime dysfunction (items 8 and 9).

Scoring system:

Component scores range from 0, indicating no problem, to 3 indicating severe difficulties. In addition, the seven component scores are summed to yield one global score that ranges from 0 to 21 with higher scores denoting poorer sleep quality. The global score has a cut-off of > 5 that has been used to distinguish poor sleepers from good sleepers. Scores ≤ 5 refer to good sleepers and scores ≥ 5 refer to poor sleepers.

Content validity& Reliability:

The tools was tested for content validity by Jury of three experts, one professor and one assistant professor of obstetrics and gynecological nursing department and one professor of community health nursing department. These experts assessed the tool for clarity, relevance, comprehensiveness and understandability. All recommended modifications in the tools were done.

The reliability of the items of the tools was assessed using cronbach's alpha test, it's results was 0.80 for women knowledge about menopause and 0.70 sleep quality which indicate an accepted reliability of the tool.

Fieldwork

Once the permission was granted to proceed with the study, the researcher started to prepare a schedule for collecting the data. Each woman was interviewed individually by the researcher who introduced herself and explained the aim of the study briefly and reassured them that information obtained is strictly

confidential and would not be used for any purposes other than research. After that, the verbal agreement was obtained to collect the necessary data.

The researcher used to go to Kafr Badran for interviewing the woman who fulfills the criteria. The study tools were answered by each woman during the interview, and the time needed ranged from 30 to 40 minutes, according to understanding and cooperation of the woman. The fieldwork was executed over Six months from the beginning of July 2022 up to the end of December 2022; three days per week (Monday, Tuesday, and Wednesday) from 3.00 pm to 6.00 pm.

Pilot study:

A pilot study was carried on 12 postmenopausal women representing about 10% of the study subjects. The purposes of the pilot study were to test applicability, feasibility, practicability of the tools. It also, helped to estimate the time needed to complete the questionnaire. According to the results of pilot study no modification made to the tools and those who shared in the pilot study were involved in the studied sample.

Administrative and ethical considerations:

Official permission for data collection was obtained by submission of official letters issued from the Dean of the Faculty of Nursing at Zagazig University to the Mayor of the village. Moreover, the researcher visited the study setting, met with the mayor of the village, explained to him the study aims and the importance of the study and asked for his cooperation.

Firstly, the study proposal was approved by the Research Ethics Committee (REC) and Postgraduate Committee of the Faculty of Nursing at Zagazig University (M.D Z U.NUR/184/13/6/2022). Then, verbal agreement for participation was obtained from each subject after full explanation of the aim of the study. Participants were given the opportunity

to refuse participation, and they were notified that they could withdraw at any stage of filling the questionnaire. No names were included in the questionnaire sheet and anonymity of each woman was protected by the allocation of code number for each woman. They were assured that the information would be confidential and used for research purpose only.

Statistical analysis:

Data entry and statistical analysis were done using SPSS 22.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations and medians for quantitative variables. The Cronbach alpha coefficient was calculated to assess the reliability of the developed tools through their internal consistency. Qualitative categorical variables were compared using a chi-square test (X^2). Whenever the expected values in one or more of the cells in a 2x2 tables was less than 5, Fisher exact test was used instead. The Spearman rank correlation was used for assessment of the interrelationships among quantitative variables and ranked ones. In order to identify the independent predictors of the knowledge and sleep quality scores multiple linear regression analysis was used after testing for normality, and homoscedasticity, and analysis of variance for the full regression models were done. Statistical significance was considered at p-value <0.05.

Results:

Among 120 studied postmenopausal women, 55% their age were from 60 to 65 years, with mean of age 60.24 ± 3.34 year. As regards to current work and marital status, it was obvious that 83.3% and 68.3% respectively of the women were housewife and married. Likewise, 90.8% of the women living with their families and 70.8% of them had sufficient income as shown in **(Table 1)**.

Figure (1): Illustrates that, 36.7% of the studied women were illiterate and only 8.3 % were university.

Figure (2): Displays that only 12.5% of the postmenopausal women were having normal weight, meanwhile 56.7% were obese.

Table (2): Demonstrates that, 58, 3% of postmenopausal women their age of menopause were from 50 to 55 years, with mean of age 49.58 ± 2.39 year. Also, 81.7% of them reported having gradual onset of menopause and 63.3% of the postmenopausal women their length of menopause were from 10 to 17 years, with mean of age 10.66 ± 3.91 year. As for the number of parity, it was found that 53.3% of the studied women were had 4-6 and 85.4% of them had normal vaginal delivery. Moreover, 75.8% of postmenopausal women were using a contraceptive method and IUD was the most common method in 54.9%.

Table (3): Shows that, 71.7% of postmenopausal women had previous Information about menopause and the most commonly source of information were friends and relatives 42.5% followed by television 21.7%.

Figure (3): Reveals that 90% of studied postmenopausal women had unsatisfactory level of knowledge about the menopause, while 10% of them had satisfactory level of knowledge about the menopause.

Table (4): shows that 2.5%, 3.3% and 2.5% respectively of the studied postmenopausal women had complete correct answers regarding the definition of menopause, causes of menopause and symptoms of menopause. Also, 89.2% of the postmenopausal women don't know the treatment for postmenopausal period. This finding shows a generally low knowledge of menopause among postmenopausal women in the study sample.

Table (5): Clarifies that highest score for sleep quality components were observed in sleep efficiency 2.72 ± 0.78 followed by sleep latency

1.93 ± 0.96 and sleep disturbances 1.84 ± 0.59 . Whereas lowest scores were observed in use of sleep medication 0.49 ± 0.96 which indicates better sleep quality in this component.

Figure (4): Portrays that 55% of the postmenopausal women had poor sleep quality while, 45% of them had good sleep quality.

Table (6): Reveals that, there was no significant relation between sleep quality of postmenopausal women and their various demographic characteristics at ($p = > 0.05$).

Table (7): Shows that, there was no significant relation between total knowledge of postmenopausal women and their total sleep quality at ($p = > 0.05$).

Table (8): Illustrates that the independent positive predictor for knowledge score was educational level. Conversely, marital status (unmarried) was independent negative predictor for knowledge score.

Discussion:

Although postmenopausal is a normal physiological stage of women's life, a significant proportion of women are likely to have various problems during this period. Sleep disturbances are frequent among postmenopausal women and the prevalence of sleep disorders ranges from 28 to 63% approximately one-third of postmenopausal women suffer from sleep disturbances⁽¹⁴⁾.

The present study sample consisted of women mostly in the sixth decade of their life; with a mean age of the studied women was 60.24 ± 3.34 years. This is a close to the age at postmenopausal stage. This is in the same line with a study carried in Neyshabur, Iran by **Jalambadani**⁽¹⁵⁾ who revealed that the mean age of postmenopausal women was 60.75 ± 3.53 years. Additionally this result agree with a study carried in China by **Zhang et al.**⁽¹⁶⁾ who revealed that the mean age of postmenopausal women was 62.6 ± 5.4 years.

Concerning the answer of research question regarding to the knowledge of postmenopausal women about menopause, the present study showed that nearly three quarter of postmenopausal women were aware regarding menopause. Friends and relatives was the most common source of information. Meanwhile a very small percentage of the women reported the use of internet as a source of information, which is quite expected in this rural community.

This result was consistent with previous studies carried by **Gebretatyos et al.** ⁽¹⁷⁾ who found that the most of the study participants were aware of menstrual irregularity, symptom of menopause, weight gain during menopause and the prevention of osteoporosis during menopause through physical activity. A similar finding was reported in Srinagar by **Ismail et al.** ⁽¹⁸⁾ who reported that the majority of studied postmenopausal women had source of information about menopause were mostly from family elders and friends.

Although most women were aware regarding menopause, but their actual knowledge was deficient. In fact, the majority of studied postmenopausal women had total unsatisfactory of knowledge about the menopause. Which might be attributable to a variety of factors as the current study was carried out in a rural area where there is a lack of health education sources. Additionally, one-third of the studied postmenopausal women were illiterate.

This result was consistent with previous studies carried by **Prajapati** ⁽¹⁹⁾ in the study of "Awareness regarding menopausal symptoms and effect on daily life of postmenopausal women" in Nepal and by **Beura et al.** ⁽²⁰⁾ in the study of "assessment of knowledge, attitude and practices towards menopause among postmenopausal women" in an urban slum of Eastern India. In the same way, the results of a study "women's knowledge of concept of menopause,

severity, and climacteric stage among women in middle age", in Northwest Ethiopia" by **Ayene et al.** ⁽²¹⁾ who found that more than two third of postmenopausal women had inadequate knowledge about the menopause.

On the contrary to the results of the current study was reported in Madinah, Saudi Arabia by **Aljohani et al.** ⁽²²⁾ in the study of "Knowledge, attitude, and experiences of menopause in postmenopausal women" who found that the most of studied women had good knowledge and awareness about menopause, while only one-tenth had poor knowledge. These differences were related to cultural and socioeconomic differences.

Therefore, the first indicator of menopause knowledge was associated with education level. Education has an important part in one's health since it influences one's ability to make trustworthy and informed healthy choices. In support of this, the multivariate analysis in the current study demonstrated that the education level was a statistically significant positive predictor of the postmenopausal women's total knowledge. This meant low education level associated with low menopausal knowledge score, "illiterate women had unsatisfactory menopausal-related knowledge".

This result is in harmony with prospective cohort study conducted by **Alharthi et al.** ⁽²³⁾ in Riyadh, Saudi Arabia who presented that marital status, education and were significantly associated with knowledge about menopause. As well, study conducted by **Abdelwahed** ⁽²⁴⁾ in Cairo, Egypt, who found that women with high educational attainment had a good level of knowledge about menopause.

Another indicator for knowledge was associated with marital status. In the current study, marital status was independent negative predictor for knowledge score. This mean that

married women had more knowledge. As married women have better social relationships and family supports leading to more of information sharing about menopause.

It is agreed with **Perera & Goonewardena** ⁽²⁵⁾ in the Southern province of Sri Lanka who reported those who were married had better knowledge regarding menopause when compared to their counterparts. Those who had higher level of education had better knowledge regarding menopause and menopausal symptoms and this was statistically significant ($p < 0.05$).

Concerning the answer of research question regarding to sleep quality among postmenopausal women, the present study showed that more than half of studied postmenopausal women had poor sleep quality. Postmenopausal women commonly complain of poor sleep quality, night awakenings, insufficient sleep, hypersomnia, snoring and apnea. Sleep disorders often begin during the menopausal transition and their prevalence increases after the definitive cessation of menses. Several studies have attempted to identify the causes of impairments in sleep quality, which may be affected by hormonal changes and the natural process of aging. The reported prevalence of sleep disorders varies from 35% to 60% in postmenopausal women ⁽²⁶⁾.

In the same line, studies conducted by **Moudi et al.** ⁽²⁷⁾ in Qaen, Iran, who studied "the relationship between health-promoting lifestyle and sleep quality in postmenopausal women" and by **Luzo et al.** ⁽²⁸⁾ at the outpatient clinic of Santa Casa de Sao Paulo, who studied "factors influencing postmenopausal women's quality of sleep", found that more than half of postmenopausal women had poor sleep quality.

On the contrary to the results of the current study, a low prevalence poor sleep quality were found in Korea by **Hwang et al.** ⁽²⁹⁾ who studied "sleep

quality and associated factors in premenopausal and postmenopausal women in Korea" discovered that about 26% of surveyed women aged 45-64 years were having poor sleep quality (global PSQI scores > 5). This disparity in the result might be due to variations in symptom reporting across race/ethnicity may contribute to the lower prevalence of poor sleep quality among Korean women.

Regarding Pittsburgh Sleep Quality Index (PSQI) subscales, it was observed that the highest mean scores were in habitual sleep efficiency, sleep latency and sleep disturbances scores whereas the lowest score was observed for use of sleep medication this indicates better sleep quality in this component.

The present finding is in agreement with the results of the study carried out by **Kim et al.** ⁽³⁰⁾ who conducted a cross-sectional observational study in Korea and found that total PSQI score, specifically the sleep latency, habitual sleep efficiency and sleep disturbances scores were significantly increased in postmenopausal women.

Similarly, a study by **Baysal** ⁽³¹⁾ in the city center of Bingol province, Turkey who found that the highest scores in PSQI subscales were in habitual sleep efficiency, sleep latency and sleep disturbances scores whereas the lowest score was observed for use of sleep medication and sleep duration.

Regarding good sleepers and poor sleepers among postmenopausal women by sleep quality components and items, the present study showed that there was no significant relation between good sleepers and poor sleepers among postmenopausal women and their subject sleep quality, sleep latency, habitual sleep efficiency, sleep disturbance and use of sleep medication at ($p = > 0.05$). Meanwhile, there was highly statistically significant relation between good sleepers and poor sleepers among postmenopausal women and

their daytime dysfunction at ($p = < 0.01$). This means that poor sleepers had the higher daytime dysfunction scores. Sleep disorder is the most prevalent and clinically prominent symptom observed during post menopause. It is linked to unfavorable health outcomes, such as exhaustion, poor daytime function, and increased visits to healthcare provider⁽³²⁾.

On the other hand, this result is in contrast with **Choi et al.**⁽³³⁾ in Tsukuba, Japan who found that there was significant differences were found in sleep duration, sleep latency and sleep efficiency between two groups (good sleepers and poor sleepers).

As regards to the relation between the sleep quality and the demographic characteristic, the present study reveals that there was no significant relation between sleep quality of postmenopausal women and their various demographic characteristics at ($p = >0.05$).

In accordance with this result, **Song et al.**⁽³⁴⁾ in Shanghai Jiao Tong, China who found that that age, BMI, and education level of postmenopausal women have no influence on sleep quality.

On the other hand, this result is in contrast with **Ahmady et al.**⁽³⁵⁾ in Rasht, Iran who found that some of the studied variables including economic status and level of education can affect sleep quality and showed that variables including age and body mass index had the highest predictive power for sleep disorder among postmenopausal women.

Regarding to the relation between the sleep quality and their menopausal, obstetric and contraceptive history, the present study reveals that there was no

significant relation between total sleep quality of postmenopausal women and their menopausal, obstetric and contraceptive history at ($p = >0.05$).

The present finding is in agreement with the results of the study carried out by **Darehzereshki et al.**⁽³⁶⁾ who conducted a quasi-experimental study in Yazd, Iran found that participants were no statistically significant difference between sleep quality and their menopausal, obstetric history in the study groups before the intervention. And in Mashhad City, Iran by **Nosrati Hadiabad et al.**⁽³⁷⁾ who reported that participants were no statistically significant difference between sleep quality of women and their the length of time since menopause and number of parity.

Conclusion:

Based on the findings of the present study, it was concluded that Most of the postmenopausal women had unsatisfactory level of knowledge about the menopause. Meanwhile, more than half of the postmenopausal women had poor sleep quality.

Recommendations:

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

- Postmenopausal women can be provided with education booklets, brochures, or CDs on sleep hygiene education and progressive relaxation exercises, and health institutions can be organized to offer progressive relaxation exercises.
- Post-menopausal clinics should be developed to promote healthy living and improve sleep patterns and quality under supervision of a healthcare professional.

Table (1): Demographic characteristics of postmenopausal women in the study sample (n=120)

| Demographic characteristics | Frequency | Percent |
|--------------------------------------|---------------------|---------|
| Age (year) | | |
| 55-59 | 54 | 45.0 |
| 60-65 | 66 | 55.0 |
| Mean±SD | 60.24 ± 3.34 | |
| Range | (55-65) | |
| Current work: | | |
| Housewife | 100 | 83.3 |
| Working | 20 | 16.7 |
| Marital status: | | |
| Married | 82 | 68.3 |
| Un married [divorced, widow, single] | 38 | 31.7 |
| Living condition: | | |
| With family | 109 | 90.8 |
| Alone | 11 | 9.2 |
| Income: | | |
| Sufficient | 85 | 70.8 |
| Insufficient | 21 | 17.5 |
| Sufficient and save | 14 | 11.7 |

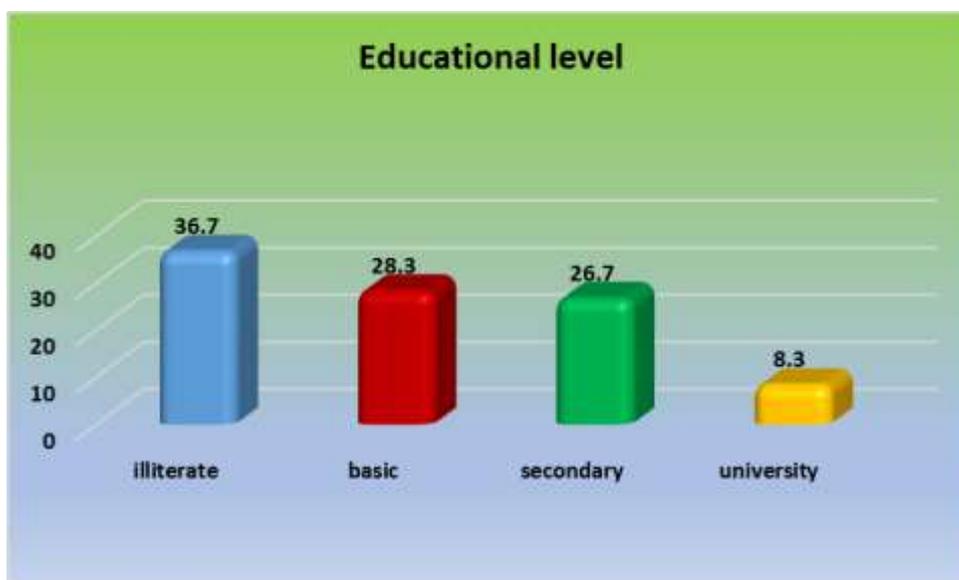


Figure (1) illustrates that, 36.7% of the studied women were illiterate and only 8.3 % had university education.

Table (2): Menopausal, obstetric and contraceptive history of postmenopausal women in the study sample (n=120).

| History | Frequency | Percent |
|-----------------------------------|--------------------|---------|
| Menopausal History | | |
| Age of Menopause (years) | | |
| 43-49 | 50 | 41.7 |
| 50-55 | 70 | 58.3 |
| Mean±SD | 49.58 ±2.39 | |
| Onset of menopause | | |
| Gradual | 98 | 81.7 |
| Suddenly | 22 | 18.3 |
| length of menopause(years) | | |
| 2- 9 | 44 | 36.7 |
| 10- 17 | 76 | 63.3 |
| Mean±SD | 10.66 ±3.91 | |
| Obstetric history | | |
| No. of parity: | | |
| null para | 3 | 2.5 |
| 1-3 | 45 | 37.5 |
| 4-6 | 64 | 53.3 |
| ≥ 7 | 8 | 6.7 |
| Mean±SD | 3.96± 1.72 | |
| Mode of delivery (n=117) | | |
| Normal Vaginal Delivery. | 100 | 85.47 |
| Cesarean section | 14 | 11.96 |
| Combined(NVD&C.S) | 3 | 2.56 |
| Contraceptive history | | |
| Contraceptive usage: | | |
| Yes | 91 | 75.8 |
| No | 29 | 24.2 |
| Contraceptive type(n=91) | | |
| Pills | 31 | 34.06 |
| IUD | 50 | 54.94 |
| Injection | 10 | 10.98 |

*Not mutually exclusive

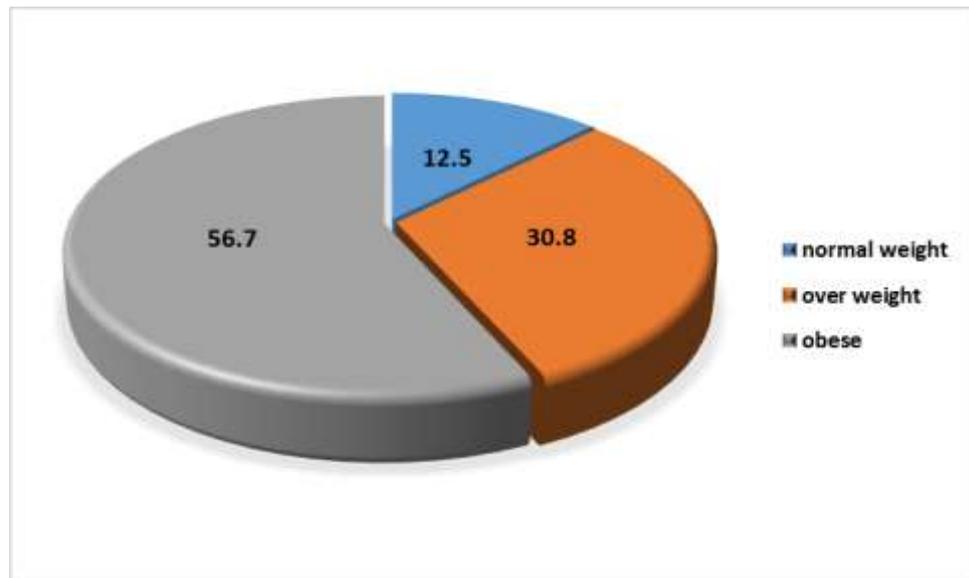


Figure (2): Body mass index of postmenopausal women in the study sample (n=120).

Table (3): Previous information and source of information regarding menopause among postmenopausal women in the study sample (n=120).

| Items | Frequency | Percent |
|--|-----------|---------|
| Previous Information about menopause: | | |
| Yes | 86 | 71.7 |
| No | 34 | 28.3 |
| Source of information @: | | |
| Reading. | 18 | 15.0 |
| Television. | 26 | 21.7 |
| Internet. | 11 | 9.2 |
| Friends and relatives. | 51 | 42.5 |
| Health care providers. | 19 | 15.8 |

@ Not mutually exclusive

Table (4): Menopause knowledge among postmenopausal women in the study sample (n=120)

| Knowledge Items | Frequency | Percent |
|---|-----------|---------|
| Definition of menopause: | | |
| Complete correct answer | 3 | 2.5 |
| Incomplete correct answer | 75 | 62.5 |
| Don't know | 42 | 35.0 |
| Causes of menopause: | | |
| Complete correct answer | 4 | 3.3 |
| Incomplete correct answer | 77 | 64.2 |
| Don't know | 39 | 32.5 |
| Symptoms of menopause: | | |
| Complete correct answer | 3 | 2.5 |
| Incomplete correct answer | 67 | 55.8 |
| Don't know | 50 | 41.7 |
| Treatment for postmenopausal period: | | |
| Yes | 13 | 10.8 |
| No | 107 | 89.2 |
| Type of treatment for postmenopausal period: | | |
| Incomplete correct answer | 13 | 10.8 |
| Don't know | 107 | 89.2 |

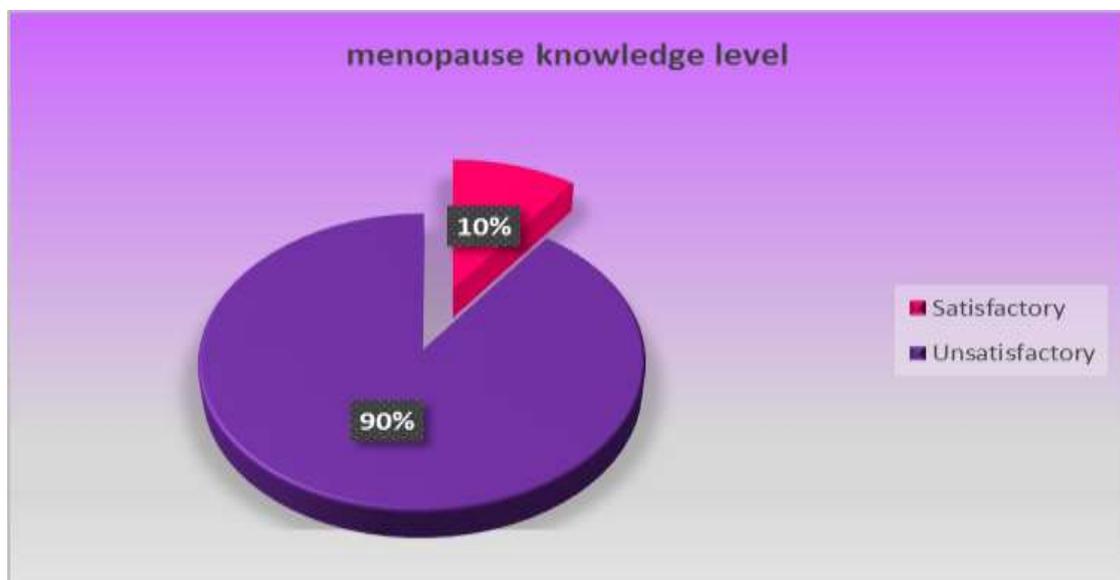
**Figure (3):** Total knowledge regarding menopause of postmenopausal women in the study sample (n=120).

Table (5): Total mean score of sleep quality components among the studied postmenopausal women (n = 120)

| Items | Mean \pm Standard Deviation |
|---------------------------|-------------------------------|
| Subjective sleep quality | 1.32 \pm .79 |
| Sleep latency | 1.93 \pm .96 |
| Sleep duration | 1.27 \pm 1.03 |
| Habitual sleep efficiency | 2.72 \pm .78 |
| Sleep disturbances | 1.84 \pm .59 |
| Daytime dysfunction | 1.18 \pm .79 |
| Use of sleep medication | .49 \pm .96 |

**Figure (5):** Total sleep quality among studied postmenopausal women (n = 120)

Table (6): Relation between sleep quality of postmenopausal women and their various demographic characteristics

| Demographic characteristics | Sleep quality | | | | X ² test | p-value |
|--------------------------------------|---------------|------|-------------|------|---------------------|---------|
| | Good (n=54) | | Poor (n=66) | | | |
| | No. | % | No. | % | | |
| Age: | | | | | | |
| 55-59 | 24 | 44.4 | 30 | 55.6 | Fisher | 1.0 |
| 60-65 | 30 | 45.5 | 36 | 54.5 | | |
| Education: | | | | | | |
| Illiterate | 16 | 36.4 | 28 | 63.6 | 2.09 | .553 |
| Basic education | 17 | 50.0 | 17 | 50.0 | | |
| Secondary | 16 | 50.0 | 16 | 50.0 | | |
| University | 5 | 50.0 | 5 | 50.0 | | |
| Current work: | | | | | | |
| House wife | 44 | 44.0 | 56 | 56.0 | Fisher | .632 |
| Working | 10 | 50.0 | 10 | 50.0 | | |
| Marital status: | | | | | | |
| Married | 38 | 46.3 | 44 | 53.7 | .188 | .664 |
| Un married [divorced, widow, single] | 16 | 42.1 | 22 | 57.9 | | |
| Living condition: | | | | | | |
| With family | 51 | 46.8 | 58 | 53.2 | 1.54 | .215 |
| Alone | 3 | 27.3 | 8 | 72.7 | | |
| Income: | | | | | | |
| Sufficient: | 37 | 43.5 | 48 | 56.5 | 2.58 | .275 |
| Insufficient | 8 | 38.1 | 13 | 61.9 | | |
| Sufficient and save | 9 | 64.3 | 5 | 35.7 | | |
| Body Mass Index: | | | | | | |
| Normal Weight | 4 | 26.7 | 11 | 73.3 | 5.56 | .062 |
| Over Weight | 22 | 59.5 | 15 | 40.5 | | |
| Obese | 28 | 41.2 | 40 | 58.8 | | |

Table (7): Relation between total knowledge of postmenopausal women, health promotion lifestyle profile and their total sleep quality

| Variables | Total knowledge | | | | X ² test | p-value |
|---|---------------------|------|------------------------|------|---------------------|---------|
| | Satisfactory (n=12) | | Unsatisfactory (n=108) | | | |
| | No. | % | No. | % | | |
| Total Pittsburgh sleep Quality Index | | | | | | |
| Good sleep | 1 | 20.0 | 4 | 80.0 | Fisher | .415 |
| Poor sleep | 11 | 9.6 | 104 | 90.4 | | |

(*) Statistically significant ($p < 0.05$)Non statistically significant ($p < 0.05$)

Table (8): Best fitting multiple linear regression model for postmenopausal women's knowledge score

| Items | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. | 95.0% Confidence Interval for B | |
|---------------------------|-----------------------------|------------|---------------------------|------------------------------|-------------|---------------------------------|-------------|
| | B | Std. Error | Beta | | | Lower Bound | Upper Bound |
| (Constant) | -1.390 | 2.618 | | -.531 | .596 | -6.575 | 3.796 |
| Age | .063 | .042 | .125 | 1.493 | .138 | -.021 | .147 |
| Educational level | .910 | .141 | .529 | 6.450 | .000 | .630 | 1.189 |
| Marital status(unmarried) | -.688 | .315 | -.190 | -2.182 | .031 | -1.313 | -.063 |
| Living condition | -.463 | .490 | -.079 | -.945 | .347 | -1.434 | .508 |
| Income | .007 | .189 | .003 | .038 | .970 | -.367 | .381 |
| R-square=0.34 | | | | Model ANOVA: F=11.69, p<0.05 | | | |

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