Effectiveness of Sleep Hygiene Measures on Sleep Quality, Activity of Daily Living and Disease Severity Among Patients with Psoriasis

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Abstract

Background: Psoriasis is a chronic autoimmune skin condition with long-term impairment and is considered as one of the five diseases that the World Health Organization (WHO) identified as having an enormous burden on patients' sleep quality and impacts on daytime functioning and health status ***(Tas, et al., 2020)***. **Aim of the study:** Was to evaluate the effectiveness of sleep hygiene measures on quality of sleep, activities of daily living and disease severity among patients with psoriasis. **Research design:** A quasi-experimental design was utilized to conduct the current study. **Setting:** The study was conducted at Dermatology, Venereology and Andrology Unit, Specialized Medical Building, Main Mansoura University hospital, Egypt. **Method:** A purposive sample of 60 adult patients were randomly classified into two equal groups 30 patients for each group. **Tools of data collection:** Four tools were used for data collection: Patients' Interviewing Questionnaire, Sleep Quality Scale (SQS), Psoriasis Area Severity Index (SPASI) and Katz Index of Independence in Activities of Daily Living. **Results:** Revealed a statistically significant relationship (p 0.05) between the Katz Index of Independence with the study group's scores on the sleep quality scale and the patients' psoriasis area severity index. Furthermore, there was an inverse correlation between sleep quality scale and Katz Index of Independence with psoriasis area severity index (-0.437) and a positive correlation between sleep quality (0.453) and Katz Index of Independence. (-0.398). **Conclusion:** The sleep hygiene measures had a positive effect on enhancing the level of sleep quality with reducing the severity of the disease and improving the performance of daily living activities among the study group's patients. **Recommendation:** The sleep hygiene measures should be involved in the routine nursing management plane for patients with psoriasis.

Keywords: Activities of Daily Living, Disease Severity, Psoriasis, Sleep Quality, Sleep Hygiene Measures.

Introduction:

Psoriasis is a chronic, polygenic, inflammatory dermatosis that affects sufferers' quality of life and represents a lifelong condition. Psoriasis can appear at any age, from early childhood to the eight decades of life. Several risk factors are acknowledged, including familial history, altered immune functioning, psychological impacts and environmental risk factors like smoking, stress and obesity, even if the actual causes of psoriasis are not entirely understood ***(Villanova, et al., 2013 & Melikoglu, 2017).***

In about 80% of patients, psoriasis typically manifests as symmetrical, sharply demarcated, erythematous, dry, scaling and itchy plaques that affect the skin of the scalp, limbs, hands, feet, sacral, and genital regions. Additionally, one of the most annoying symptoms of the condition is pruritus (or itching) which is frequently caused by psoriasis, is disfiguring and uncomfortable. However, the plaques may persist for months to years, the complete relief is still possible ***(Gudjonsson, et al., 2012& Van De Kerkhof, et al., 2012).***

The influence of psoriasis on a person's quality of life, however, serves as a gauge for how severe the condition is. The National Psoriasis Foundation divides psoriasis severity into three categories: mild psoriasis (defined as affecting less than 3 percent of the body), moderate psoriasis (3 percent to 10 percent), and severe psoriasis (defined as affecting more than 10 percent of the body). Less than 25% of people with psoriasis have cases that are deemed

moderate to severe, while about 80% of all cases are categorized as mild. ***(Helmick, et al., 2014 & Møller, et al. 2015 & Hägg, et al. 2017).*** Greater disease severity increases a person's susceptibility to the disease's chronicity, harmful side effects, and emotional impact ***(Wahl, et al. 2014& Korman, et al. 2015).***

Sleeping enough and getting a decent night's sleep are essential human requirements ***(Yazdi, et al., 2016).*** A decent night's sleep of eight hours enables a person to wake up feeling rested and helps them perform normally during the day. In contrast, A person's ability to fall asleep, stay asleep or wake up frequently throughout the night is affected by a sleep disorder, which may result in irritability, fatigue, weakness, lack of focus and daytime sleepiness. Sleep disturbances can reduce work productivity and hinder ADL ***(Khan, 2020).***

Due to its cutaneous manifestations, psoriasis may have a direct impact on the emergence of sleep disturbances. The primary circadian mediator of core body temperature (CBT) is the skin, and a fall in CBT in the late evening is a key mechanism for the onset of sleep. The distal-to-proximal gradient in skin temperature, heat removal, and water loss via the epidermis all rise when the CBT decreases as a result of decreased metabolic heat output, higher cutaneous blood flow and vascular dilatation distally ***(Gupta, et al., 2016).*** Moreover, the pruritus associated with psoriasis is also thought to be a major cause of sleep disturbance because it frequently appears or gets worse at night ***(Smolensky, et al., 2015).***

In order to have perfect nightly sleep quality and complete daytime alertness, it may be required to engage in a variety of routines and habits known as sleep hygiene measures ***(National Sleep Foundation, 2017).*** Sleep hygiene is the endorsed activities and environmental practice that is supposed to enhance the sleep quality ***(Irish, et al., 2014 & Green, 2017).***

Twenty healthy sleep habits that can help a patient get more restful sleep were clarified by (***Brick, et al., 2010 & Green, 2017 & Ahmed, et al., 2019)*** which included waking up at the same time each day, avoiding staying in bed if you can't sleep, maintaining a regular bedtime that is relaxing, calming one's mind with relaxation techniques, setting up the bedroom for comfort while sleeping, using the room only for sleep and intimacy, avoiding using electronic devices such as phones, laptops, or other electronics just before bed, select the ideal mattress, select luxurious linens and pillows, avoid noise in the bedroom, stay away from coffee and energy drinks, avoid drinking alcohol at night, stay hydrated and eat less of the foods that are spicy, sweet or contain caffeine before bed, frequent exercise, get some sun, give up smoking, avoid sleeping pills and consider the adverse effects of the prescription.

Significance of the study:

Psoriasis is one of the most prevalent T-cell-mediated disorders; in fact, it is now recognized as a multisystemic illness rather than just a condition that affects the skin. According to the World Psoriasis Day consortium, it is widespread and may impact 125 million individuals, or about 3% of the world's population ***(Armstrong, et al., 2021).*** However, from 2015 to 2018, there were about 500,000 cases of psoriasis in Egypt (***El-Komy, et al., 2020).*** Through nocturnal itch and pain, psoriasis is likely to directly interfere with sleep, which can lead to movement disorders, restrictions on daily activities, poor occupational performance and irregular circadian rhythms ***(Gowda, et al., 2010).***

The association between sleep quality and psoriasis severity has not been adequately described, despite the fact that psoriasis is known to generally interfere with sleep. Here, we conduct a study to evaluate the effectiveness of sleep hygiene measures on sleep quality, activity of daily living and disease severity among patients with psoriasis.

Aim of the study:

The aim of this study was to evaluate the effectiveness of sleep hygiene measures on quality of sleep, activities of daily living and disease severity among patients with psoriasis.

Research hypothesis:

1. The sleep quality among patients who practice the sleep hygiene measures will be improved.

2. The disease severity will be diminished among patients who practice the sleep hygiene measures rather than who did not practice it.

3. Activities of daily living among patients who practice sleep hygiene measures will be positively improved.

Operational definitions:

Sleep Hygiene Measures:

These are a set of designed measures to be

followed by patients with psoriasis who enrolled in the study group to promote their sleep quality which would then enhance their activities of daily living and lessen the severity of their psoriasis.

Sleep Quality:

It is the self-reported experience of psoriasis patients who took part in the study and reported getting a good night's sleep with no interruptions and being fully alert during the day.

Disease Severity:

The intensity of psoriasis among the participated patients in the study was assessed using simplified psoriasis area severity index (SPASI) for erythema, plaque, scaling and pruritus.

Activities of Daily Living:

The ability of research participants with psoriasis to perform several essential functions on their own, such as washing, dressing, toileting, transferring, maintaining continence and feeding.

Methods:

Research design:

A quasi-experimental design was utilized to meet the aim of this study. This study instituted two groups, one as study group which had undergone tailored training on sleep hygiene practices and the other control group which had received the routine care and information.

Setting:

The study was conducted at Dermatology, Venereology and Andrology Unit, specialized medical building, Main Mansoura University hospital. The unit consists of 7 rooms, two of them for patients with psoriasis and the other four rooms for other chronic dermatology cases.

Subjects:

A purposive sample of 60 adult patients (30 for the study group and 30 for the control group) was recruited for the conduction of this study from the above-mentioned setting under the following criteria:

Inclusion Criteria:

Adults (20–60 years old), willing to participate in the study, with a condition that has lasted for at least a year, moderate psoriasis vulgaris, who regularly visited the dermatology ward, were able to communicate, and who had not previously participated in a sleep hygiene measures education or training program.

Exclusion criteria:

Patients on chemical drugs for enhancing sleep, patients on Psoralen Ultra Violet A (PUVA), on steroids and immunosuppressant therapy, with co-morbid illness like diabetes mellitus, hypertension and bronchial asthma.

Sample size:

Based on data from literature **(Melikoglu, 2017)**, considering level of significance of 5%, and power of study of 80%, the sample size can be calculated using the following formula **(Charan and Biswas, 2013:**

$$n = \frac{2(Z\alpha/2 + Z\beta)^2 \times p\,(1-p)}{(d)^2}$$

where, p = pooled proportion obtained from previous study; d = expected difference in proportion of events; Zα/2 =1.96 (for 5% level of significance) and Zβ = 0.84 (for 80% power of study). Therefore,

$$n = \frac{2(1.96 + 0.84)^2 \times 0.603\,(1-0.603)}{(0.359)^2} = 29.1$$

Therefore, the sample size required is 30 in each group.

C-Tools of data collection:

Data was collected by using the following tools:

Tool I: Structured Interviewing Questionnaire:

It was developed by the researchers and written in a simple Arabic language after reviewing the related literature: ***(Bhosle, et al., 2006 & Inanır, et al., 2006 & Revathi, 2013 & Melikoglu, 2017& Elkomy, et al., 2020 & Mohamed and Ibrahim, 2021).*** It composed of two parts.

Part (1): Was concerned with studied patients' demographic data which included, age, gender, marital status, educational level, residence, occupation and smoking.

Part (2): Was concerned with studied patients' medical history which included, duration of illness, family history, type of psoriasis and area of psoriasis.

Tool II: Sleep Quality Scale (SQS):

Yi, et al. (2006) developed the Sleep Quality Scale (SQS), which is used as a pre-posttest to gauge the quality of sleep in a range of patient and research populations. The 28 items in this tool are divided into six categories: daily symptoms, restoration after sleep, problems initiating sleep, problems

maintaining sleep, difficulty waking up and sleep satisfaction.

Scoring System:

Using a four-point, Likert-type scale, respondents indicate how frequently they exhibit certain sleep behaviors as following;

0 indicates few, 1 indicates sometimes, 2 indicates often and 3 indicates almost always.

Total scores can range from 0 to 84, with higher scores indicating more acute sleep problems, that was classified as the following:

≥ 60 % was considered less acute sleep problems and **< 60%** was considered a high acute sleep problem.

Tool III: Simplified Psoriasis Area Severity Index (SPASI):

Simplified Psoriasis Area Severity Index (SPASI) is a standardized tool was developed by ***Fredrickson & Patterson, 1978***. The aim of this tool was used to measure the psoriasis severity, using pre-posttest. The tool is a rating scale with 4 components which are erythema, plaque, scaling and pruritus, each component of them has 5 items as follows;

Erythema: no erythema, faint erythema, definite light red, dark red and beefy red.

Plaque: complete flattening, complete flattening but borders palpable, definite elevation but no thick plaque, definite elevated thick plaque with sharp edge and very thick distinctive plaque with sharp edge.

Scaling: no scaling, sparse fine scales, lesions only partially covered, coarser scale, covered, entire lesion covered with coarse scales and very thick adherent grayish white coarse scale possible fissures.

Pruritus: none, mild pruritus, moderate pruritus, severe pruritus and very severe pruritus.

Scoring system:

For each component the score assigned is from 0-4. The total score is 16 for all components. The responses for the items were as follows: severe (15-16), moderate (12-14), mild (9-11) and very mild (6-8).

Tool IV: Katz Index of Independence in Activities of Daily Living:

The Katz Index of Independence in Activities of Daily Living is a standardized instrument created by ***(Katz, et al., 1970)***, and later amended by (***Wallace & Shelkey, 2007)***. It is the most suitable tool to evaluate functional status as a gauge of the client's capacity to carry out daily living activities on their own. The tool is often used by clinicians during pre-posttest to identify issues with carrying out daily living activities and to plan therapy accordingly. The Index rates how well patients accomplish the six tasks of bathing, dressing, toileting, transferring, maintaining continence and feeding. In each of the six functions, clients are given a yes/no rating for their independence.

Scoring system:

Total score is 6, each activity is given 1, score ranges from 0-1, which is equally divided into three levels: (6) indicates full function, (4) indicates moderate impairment and (2 or less) indicates severe functional.

Content validity and reliability:

Content validity:

A group of four experts and reviewers from the faculty of nursing's medical surgical nursing department and two experts from the faculty of medicine's dermatology department at Mansoura University determined the face and content validity of Tool 1 and the sleep hygiene measures. Each expert on the panel was tasked with judging the study instruments' applicability, completeness, completeness, and relevance. The proposed instrument received support from more than 90% of the experts, and the necessary adjustments were made as a result.

The Reliability:

The Cronbach's alpha (internal consistency) value of the Structured Interviewing Questionnaire was 0.812 to assure that it was reliable before data collection. However, the other used tools were already valid tools and were used in its original English language because the researchers had completed the answer after asking patients. The reliability of, based on standardized items (Cronbach's Alpha), the Sleep Quality Scale (SQS) was set at 0.892, the Psoriasis Area Severity Index (SPASI) was 0.901 and the Katz Index of Independence was 0.897.

Research ethical consideration:

The Faculty of Nursing's Research Scientific Ethical Committee, Mansoura University, granted an ethical approval with a reference number (0337). Patients who took part in the study were informed of its aim by the researchers. The privacy and confidentiality of the patients' data are maintained by the researchers. Patients had the option of participating or not, and

they were informed that they might leave the research at any moment and without providing a reason.

Pilot study:

In a pilot study, 10% of the participants (6 patients) were employed to assess the feasibility, applicability, and processing speed of the study tools. These individuals were eliminated from the study sample and the findings were then used as a guide to reassemble the modifications that needed to be made to the data collection tools.

Field work:

Data collection of the current study was carried out through six months, from the beginning of April 2022 to the end of September 2022. The study was conducted through four phases:

A. Preparatory phase:

It involved reading up on relevant literature and gaining theoretical understanding of numerous study-related topics using books, papers, websites, periodicals, and journals to create the data gathering instruments.

B. Assessment phase:

This phase began in the Dermatology, Venereology, and Andrology unit with 60 patients who met the study criteria being interviewed in small groups (2–3 patients) to explain the goal of the study and obtain their consent before data collection. The researchers created an outline and simple Arabic-colored educational booklet to cover the sleep hygiene measures that would be used in the study groups based on the piloting and starting point data acquired ***(Hirshkowitz, et al., 2015 & WHO, 2016 & Lammers-van Der Holst, et al., 2020).***

C. Implementation phase:

The researchers attended the previously mentioned clinical setting two days per week during morning and afternoon shifts. At this phase, the sample was divided into study group and control group randomly and equally (30 for the study group and 30 for the control group). The researchers interviewed and coded the patients in the control group who received the standard hospital care only in small groups (2-3 patients) to collect base line data using Tools I, II, III and IV. After that, the patients in the study group who underwent the sleep hygiene measures in addition to standard hospital care were interviewed and coded by the researchers, who then used Tools I, II, III, and IV to collect pre intervention data. Only the study group received the program, either individually or in small groups of 3–4 patients over 2 sessions. Each session lasted between 40 and 60 minutes and consisted of lectures, group discussions and use of the instructional colored booklet that was given to each patient to aid in review and support teaching. Following each session, there was time for 5 minutes of discussion and giving feedback as follows:

Session one: Explaining the reasons and importance of the sleep hygiene measures instructions and introducing an explanation about psoriasis definition, psoriasis causes, psoriasis symptoms, psoriasis types, psoriasis complications, psoriasis treatment and general instructions for patients with psoriasis.

Session two: A clarification about the sleep hygiene measures program steps including sleep disorders definition, biological clock, symptoms of sleep disorders, symptoms of insomnia and measures to manage insomnia.

At the end of the program, we received notes from the patients and thanked them for their cooperation with us.

D. Evaluation phase:

The patients were called for a follow-up 4 weeks after the assessment at the first interview for both groups during the period of hospitalization and in outpatient clinic. Comparison was done between the two groups in order to determine the effectiveness of sleep hygiene measures instructions on the patients' sleep quality, activity of daily living and psoriasis severity, an evaluation was done by using (tool I part 2 & tool II & tool III& tool IV).

Statistical analysis:

Version 20.0 of SPSS for Windows was used for all statistical calculations (SPSS, Chicago, IL). Continuous data had a normal distribution and were reported in terms of mean and standard deviation (SD). Categorical data were presented as percentages and numbers. Variables and categorical data were compared using the chi-square test (or fisher's exact test, where appropriate). To check for correlations between two variables with continuous data, the correlation co-efficient test was utilized. The study's questionnaires underwent an internal consistency (reliability) test. P 0.05 was used to determine statistical significance.

Results:

Table (1): Illustrates comparison between study group and control group according to patients' demographic data that there was no significant difference in demographic data of all the studied groups. The highest percentage of patients were 30-40 years old among the both groups, as well as the mean age of both groups was too similar 33.6 ±7.3 for the study group, while 33.7 ±7.9 for the control group. Regarding the gender, male patients made up somewhat more than half of patients in both groups (53.3% for study group & 56.7% for control group).

Concerning marital status, married patients represented less than the half of the sample 40 % and 43.4% in both study and control group respectively. Related to the level of education, it was found that nearly more than two thirds of both groups were secondary school 76.6 for study group and 70% for control group. Residence of patients in study group were equal in urban and rural areas 50%, whilst in control group the highest percentage of patients were living in rural areas.

Working status showed that highest percentage among patients in the study group and control group were not working (60% & 53.4%) respectively. In respect to the smoking, it was found that the largest proportions of the participants in both groups were not smokers (63.3%) for study sample, and (66.7%) for control sample.

Table (2): Demonstrated that 50% of the study group has psoriasis for (3-5 years), however 70 % of the control group has psoriasis for (1- 2 years). As regard, family history of the patients in both groups was almost identical 53.3% and 56.7% in study and control groups respectively. Respecting the type of psoriasis, plaque psoriasis was the most common type among the participants in both groups 53.3% (study group) and 56.7% (control group), while the fewest types were nail psoriasis and layered psoriasis (3.3% for each one) in the study group, and were purulent psoriasis (3.3%) in the control group. In connection with areas of the psoriasis, elbow, back, and scalp were the most affected areas of psoriasis among the study group (80%, 70%, and 56.7%) respectively, though, back, scalp, and elbow were the most affected areas of psoriasis among the control group (80.3%, 60%, and 53.3%) respectively, with statistically significant difference was found at elbow between both groups where p=0.028*; p=<0.05*.

Figure (1): Exemplifies comparison between the study and the control group according to their Sleep Quality Scale; 46% of the patients in the study group have less acute problem pre implementation of the program, whereas this percentage is surged to 83.3% after implementation of the program. However, 56.7% of the participants in the control group suffered from less acute problems during pre-program implementation phase, this rate lessens to 40% during post program implementation phase with statistically significant differences between both groups in post phase at $p \leq 0.05$ where $p = 0.044$*.

Figure (2): Shows comparison between the control and the study group according to their psoriasis area severity index; 50% and 56.7% of participants in the study and control groups, respectively have mild purities, whilst the lowest percentage was for severe pruritus among both groups (6.7% for study group) and (10% for the control group) pre implementation of the program. In comparison to post implementation of the program; this table clarifies that 86.7% of the study group and 56.7% of the control group have mild pruritus with statistically significant differences between both groups in post phase at $p \leq 0.05$ where $p = 0.015$*.

Figure (3): Explains comparison between the control and the study group according to their Katz Index of Independence; pre implementation of the program 40%and 33.3% of the patients in the study group and control group respectively had moderate impairment of their daily living activities. Comparatively post implementation of the program; this result shows that 70 % of the study group were fully functional of their daily living activities, while just 40% of patients in the control group with statistically significant differences between both groups in post phase at $p \leq 0.05$ where $p = 0.046$*.

Table (3): Shows that there was a statistically significant between sleep quality scale with patients' psoriasis area severity

index and Katz Index of Independence scores for the study group p<0.05. Furthermore, there was a positive correlation between sleep quality and Katz Index of Independence (0.453), and inverse correlation between the sleep quality scale and Katz Index of Independence with psoriasis area severity index (-0.437& -0.398, respectively).

Table 1: Comparison between study group and control group according to patients' demographic data (n=60).

Demographic data	Study group		Control group		Chi-Square / Fisher's exact test	
	n	%	N	%	X^2	P
Age (Years)						
20 – 30	7	23.3	9	30.0		
30 – 40	19	63.3	15	50.0		
40 or More	4	13.3	6	20.0	1.704	0.426
Mean ±SD	33.6 ±7.3		33.7 ±7.9		0.051	0.960
Gender						
Male	16	53.3	17	56.7		
Female	14	46.7	13	43.3	1.669	0.196
Marital status						
Married	12	40.0	13	43.4		
Single	15	50.0	12	40.0		
Widow	3	10.0	5	16.6	0.357	0.837
Educational level						
Secondary school	23	76.6	21	70.0		
University	7	23.3	9	30.0	0.341	0.559
Residence						
Urban	15	50.0	12	40.0		
Rural	15	50.0	18	60.0	0.606	0.436
Occupation						
Not working	18	60.0	16	53.4		
Office work	6	20.0	7	23.3		
Manual work	6	20.0	7	23.3	2.865	0.238
Smoking						
Yes	11	36.7	10	33.3		
No	19	63.3	20	66.7	0.693	0.405

Table 2: Comparison between study group and control group according to patients' Medical History (n=60).

Patients' Medical History	Study group		Control group		Chi-Square / Fisher's exact test	
	n	%	n	%	X^2	P
Duration of Illness (in years)						
1 – 2	8	26.7	21	70.0		
3 – 5	15	50.0	7	23.3		
6 – 8	4	13.3	1	3.3		
9 or more	3	10.0	1	3.3	3.867	0.276
Family history						
Yes	16	53.3	17	56.7		
No	14	46.7	13	43.3	0.067	0.795
Type of psoriasis						
Plaque	16	53.3	17	56.7		
Nail	1	3.3	0	0.0		
Qatari	5	16.7	5	16.7		
Arthritis	2	6.7	2	6.7		
Erythrodermic	5	16.7	3	10.0		
Layered	1	3.3	2	6.7		
Purulent	0	0.0	1	3.3	2.864	0.826
Areas of the psoriasis						
Scalp	17	56.7	18	60.0	0.069	0.793
Ears	7	23.3	8	26.7	0.089	0.766
Elbow	24	80.0	16	53.3	4.800	0.028*
Knees	12	40.0	13	43.3	0.069	0.793
Nails	3	10.0	4	13.3	0.162	0.688
Back	21	70.0	25	83.3	1.491	0.222

Figure1: Comparison between study group and control group according to patients' Sleep Quality Scale (SQS) at pre and post implementation of the program(n=60).

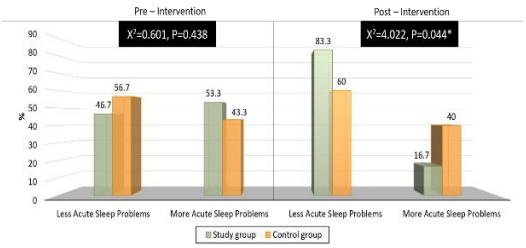

Figure 2: Comparison between study group and control group according to patients' psoriasis area severity index (SPASI) at pre and post implementation of the program(n=60).

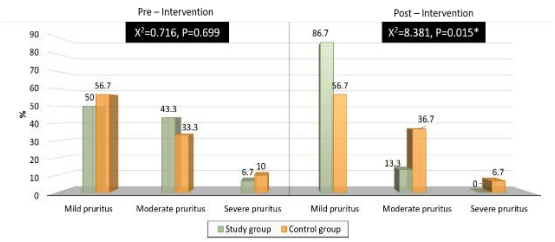

Figure 3: Comparison between study group and control group according to patients' Katz Index of Independence at pre and post implementation of the program(n=60).

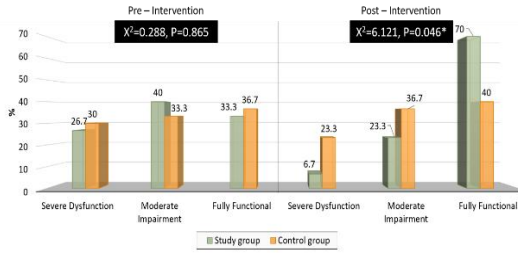
Pre – Intervention
X²=0.288, P=0.865
Post – Intervention
X²=6.121, P=0.046*
%
70
60
50
40
30
20
10
0
26.7
30
40
33.3
33.3
36.7
6.7
23.3
23.3
36.7
70
40
Severe Dysfunction
Moderate Impairment
Fully Functional
Severe Dysfunction
Moderate Impairment
Fully Functional
Study group
Control group

Table 3: Correlation between Sleep Quality Scale (SQS), psoriasis area severity index (SPASI) and Katz Index of Independence for study group at post implementation of the program(n=30).

Items	Sleep Quality Scale		Simplified Psoriasis Area Severity Index		Katz Index of Independence	
	r	p	r	p	r	p
Sleep Quality Scale.			-0.437	0.016*	0.453	0.012*
Simplified Psoriasis Area Severity Index.	-0.437	0.016*			-0.398	0.029*
Katz Index of Independence	0.453	0.012*	-0.398	0.029*		

Discussion

Psoriasis is one of many medical conditions that can manifest as poor sleep quality. Untreated sleep disorders have a negative impact on daytime performance in social and professional settings and generally health status and may worsen the disease severity **(Nowowiejska et al., 2021)**.

This study was carried out to evaluate the effectiveness of sleep hygiene measures on sleep quality, disease severity and activities of daily living among patients with psoriasis. The current study results showed a significant improvement in the sleep quality, increasing the level of daily living activities and diminishing the disease severity after implementing the sleep hygiene measures on patients with psoriasis. Therefore, these findings proved the set hypothesis with confirmation of the effectiveness of the implemented measures.

A descriptive analysis of the demographic variables in both study group and control group revealed that, the highest percentage of patients were 30-40 years old among the both groups with mean age 33.6 ±7.3 for the study group, while 33.7 ±7.9 for the control group. The similarity in distribution of age amongst study and control groups indicates a non-significant difference, thereby eliminating error due to sampling bias. This finding goes in line with the findings of ***(Guillet, et al, 2022)*** that psoriasis typically manifests at a younger age in men than in women, with a mean age of onset of 33 years. This is also similar to **(Kouris, et al., 2017)** who found that the age group among the patients in his study ranged from 20 to less than 45 years and added that the younger patients seem to be more susceptible to psoriasis. Otherwise, the result of **(Revathi, 2013)** who disagrees with the recent result and mentioned that the majority of patients in his study belong to the 41-50 age range in the study and control groups, moreover, the mean age was 41.3±12.4 among the patients in a conducted study by **Melikoglu (2017)**.

Referring to the gender, slightly more than half of the patients in both groups were male. This finding demonstrated that there is no significant difference in the percentage of psoriasis patients by gender. It was further supported by **Hägg, et al., 2017** who stated that, while psoriasis prevalence is thought to be balanced between the sexes, women tend to have less severe cases than men due to estrogen, a female sex hormone that has positive effects on skin ageing, water-binding capacity and wound healing. This finding contrasts with that of **(Revathi, 2013)** who claimed that the proportion of females in the study group was greater than the half, however in the control group, gender equality was noticed.

In terms of marital status, less than half of the sample in both the study and control groups were married patients. This is made clear by ***(Schielein, et al., 2020)***, who claimed that a number of factors, including psoriasis patients' lack of employment and absence from school or university, may be the causes in addition to the decline in social interactions, inability to start a family, or breakdown of the already-existing family system. According to researchers' opinion, psoriatic patients have a disordered sexual life because they are less able to operate in daily life and form social ties. In contrast, ***(Revathi, 2013)*** stated that both categories' majorities of people were married.

Related to the level of education, it was found that nearly more than two thirds of both groups were secondary school for study group and for control group while the least proportion

among the patients in both groups had university degree. This finding perhaps indicates to patients with university degree are more knowledgably regarding management of the disease and therefore the severity of their disease is reduced. This consistent with **(Revathi, 2013)** who demonstrated that the majority of patients in both the study group and the control group were educated up to secondary school.

In reference to the residence of the participants in the study group were equal in urban and rural areas, whilst in control group the highest percentage of patients were living in rural areas. This result disagrees with **Revathi (2013)** who depicted that the highest proportion of patients in both groups were living in urban areas. In addition, the study of (**Chiriac, et al., 2017)** who reported that the majority of his studied patients were settled in urban areas. This difference between the current result and the results of previous studies may be due to the study was conducted at Mansoura University hospital receives patients many rural areas and suburbs that surround Mansoura city.

With regard the working status, the findings showed that the majority of patients in the study group were not working in both groups. The result goes in the same line with **(Revathi, 2013)** who showed that the majority of patients in both groups had no occupation. This result discussed by **(Nowowiejska et al., 2021)** who stated that psoriasis patients are reportedly less productive workers. Additionally, (**Pilon, et al., 2019)** mentioned that the National Psoriasis Association of America claimed that these sufferers miss 56 million hours of work annually. In researchers' perspective, severe psoriasis can result in occupational disability among the patients.

In respect to the smoking, it was found that the largest proportions of the participants in both groups were not smokers. From the researchers' point of view, this result may be due to two reasons; first, increasing awareness among the patients regarding the harmful effectiveness of the smoking on the disease severity, second, the proportions of female to male in this study are so close and the smoking habit is lower among women. This result totally agreed with the results of studies were conducted by **Moselhy and Abdallah, 2022 & Chiriac, et al., 2017** who clarified that most patients who enrolled in the study were nonsmokers, whilst this result contrasts entirely with **El-Komy, et al., (2020)** who said that most of the patients who participated in his study were smokers. Furthermore, **Li, et al., (2013)** confirmed that smoking is a distinct risk factor for psoriasis. According to research, heavy and long-term smokers are at a higher risk of developing this condition.

Regarding to the duration of illness, half of the study group's participants has psoriasis for (3-5 years), however majority of the control group has psoriasis for (1- 2 years). This result contraries to **Bulat, et al., 2020** who told that the lowest percentages of the study sample had disease for less than 3 years and 3-5 years, in addition to the study of **(Revathi, 2013)** who reported that more than half of the patients had 6-10 years in the study group, but had 1-5 years in the control group.

As regard family history, more than half of the patients in both study and control groups had a positive family history. This is explained by the findings of **(Carole, et al., 2022)** who discovered that psoriasis is assumed to be produced by the combination of numerous hereditary and environmental factors; in fact, the potential occurrence is higher among first- and second-degree relatives. This finding fully contrasts with that of (**Bulat et al., 2020),** who found that the majority of participants had no known family members history with psoriasis.

Respecting the type of psoriasis, plaque psoriasis was the most common type among the patients in both groups, while the fewest types were nail psoriasis and layered psoriasis in the study group, however purulent psoriasis was the least common type among the patients in the control group. This compatible with a study by (**El-Komy, et al, 2020)** which highlighted plaque psoriasis as the most prevalent variety of the condition, followed by guttate psoriasis, while pustular psoriasis and chronic palmoplantar pustulosis were considered less common. Moreover, the study that conducted by **Asokan et al., (2011)** revealed that plaque psoriasis affected the majority of the cases that were included.

In connection with areas of the psoriasis, elbow, back and scalp were the most affected areas of psoriasis among the study group, though, back, scalp and elbow were the most

affected areas of psoriasis among the control group. This finding is well-matched with **Nowowiejska et al., 2021** who claimed that plaque psoriasis is the most prevalent variety of psoriasis; it commonly affects the scalp, elbows and knees but can affect any part of the body and manifests as scaly papules and plaques. Additionally, the result is supported by the finding of **El-Komy, et al, (2020)** who found that lower limbs, upper limbs and scalp were the most commonly affected sites among patients with psoriasis, whereas the genitalia, neck and soles were the least affected areas.

Concerning the patients' sleep quality, the findings of the recent study confirmed that there had been a significant improvement among the study participants after implementation of the sleep hygiene measures; more than half of the study participants had more acute sleep problems during the pre-implementation phase, but there had been radical changes as the majority of patients had less acute sleep problems post the sleep hygiene measures' implementation phase. Contrarily, more than half of the control group's patients had less acute sleep problems during the pre-implementation period; however, this finding is reversed during the post-test phase and became less than half of the patients had more acute sleep problems. This matched with a study conducted by **Shutty et al., (2013),** which discovered a correlation between poor sleep quality and a positive result. However, post implementation a sleep hygiene program, the study group's sleep quality significantly improved. These findings clearly illustrate the positive effectiveness of sleep hygiene measures on sleep quality in psoriasis patients and supported the null hypothesis as well.

Related to psoriasis area severity index, half of patients in the study and the control groups had mild purities during pre implementation phase of the sleep hygiene measures. However, in the post implementation phase, this result boosted and recorded that the majority of the study sample had mild pruritus, whereas the finding did not change for the control group with statistically significant differences between both groups in post test phase. This totally agrees with the conducted study by **(Revathi, 2013)** who found that patients in both groups had moderate psoriasis pre-test and then witnessed diminution in the severity to mild disease among most of the study sample posttest, although the severity of disease remained moderate for the control group. Therefore, the result of current study showed clearly that there was a reduction in the severity with passage of the time in the study, indicating that the sleep hygiene measures had a positive influence on reducing pruritus and therefore reducing the degree of disease severity and hence, the hypothesis was accepted for the study.

Considering to the Katz Index of Independence; the present study findings revealed that less than half of the patients among the study group had moderate impairment of their daily living activities during pre-test phase, whilst in the control group, there was almost more than one third of the patients had fully functional of their daily living activities. In contrast, this result changed dramatically for the study group and converted to the majority of the patients in the study sample were fully functional of their daily living activities post implementation of the sleep hygiene measures, while the daily living activities among patients in the control group witnessed a small modification and recorded less than half of them were fully functional with statistically significant differences between both groups in post-test phase.

This goes in the same line with **(Revathi, 2013)** who illustrated that there was an improvement in the ADL score in the study group from pre-test to post-test, however the control group demonstrated that there was a diminution in ADL score. Overall, in researchers' opinion, the results of recent study confirmed that any simple negative change in the sleep quality may result in a harmful effect on the performance of daily living activities. Hence, the current data demonstrated that the sleep hygiene measures had a significant influence on the study group's improvement in ADL.

Referring to the correlate between the quality of sleep, psoriasis severity and ADL, the result shows that there was a statistically significant between sleep quality scale with patients' psoriasis area severity index and Katz Index of Independence scores for the study group. Moreover, there was a positive correlation between sleep quality and Katz Index of Independence, nevertheless there was an inverse correlation between sleep quality scale and Katz Index of Independence with psoriasis area severity index. This means that as sleep quality

improves, the severity of the psoriasis lessens, but activity daily living levels rise.

Similar findings were identified by **Revathi (2013)** who claimed that there was a positive correlation between sleep quality, daily living activities and psoriasis severity in the post-test and this refers to, when the sleep quality recovers, the psoriasis severity decreased by a sleep hygiene measures education package. Furthermore, this result was confirmed by study of **(Taş, et al., 2020)** who stated that subjects who having higher PASI values had worse SQ.

Conclusions:

The result concluded that there was statistically significant improvement regarding increasing the level of sleep quality, enhancing the performance of daily living activities with decreasing the severity of the psoriasis after implementation of the sleep hygiene measures among the patients in the study group.

Recommendation:

On the basis of the study's findings, the following recommendations were suggested:

- Replication of the study on a larger sample and for longer period to achieve generalizability of the results and wider application of the sleep hygiene measures.
- The sleep hygiene measures should be involved in the routine nursing management plane for patients with psoriasis.
- Other dermatological conditions can be included in further studies like vitiligo.
- Comparison can be done between two settings.

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