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Impact of Uremic Pruritus Nursing Management on Itching and Sleep Disturbance among Hemodialysis Patients

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Abstract: Uremic pruritus is considered one of the most common complications in hemodialysis patients. It has a negative impact on patients' physical, psychological and social wellbeing that leads to increase morbidity and mortality rate among hemodialysis patients. Nursing management plays an important role for those patients, to promote sleep quality, decrease itching severity and improve their quality of life. This study aimed to evaluate impact of uremic pruritus nursing management on itching and sleep disturbance for hemodialysis patients. A quasi experimental research design was utilized in this study. A purposive sample of (80) hemodialysis patients with uremic pruritus was randomly divided into two groups with equal size. The current study was conducted in the hemodialysis unit at New General Mansoura Hospital. Interview questionnaire sheet consisted of three parts demographic data, 5 – D scale and the Pittsburgh Sleep Quality Index (PSQI) questionnaire. The current study revealed that uremic pruritus nursing management decreased severity of pruritus and increased sleep quality in study group compared to control group. As well as there was a significant, positive and strong correlation between first, second and third assessments of 5_D pruritus and PSQI scores over intervals of examination ($P < 0.001$). The study concluded that, hypothesis of the current study was accepted as patients who receive the uremic pruritus nursing management have a decrease in their itching severity and improvement in their sleep quality. The study recommended that, written, colored booklet about uremic pruritus nursing management should be provided for hemodialysis patients. Also further similar researches to be conducted in other hospitals with larger samples.

Key words: Hemodialysis (HD) · Itching · Nursing Management · Sleep Disturbance · Uremic Pruritus (UP)

INTRODUCTION

Uremic pruritus is considered one of the most common complications in hemodialysis patients. It is observed in 50 - 90% of patients undergoing hemodialysis at different levels from mild to severe pruritus; it usually starts 3 to 6 months after the onset of hemodialysis. However, in some patients uremic pruritus may be present even before starting hemodialysis sessions [1].

Uremic pruritus is an undesirable condition that triggers itching and negatively affects sleep quality. It results in nocturnal awakenings, difficulty in falling asleep and daytime sleepiness, attention distraction and impairments of body functions. Indeed, patients on hemodialysis suffering from moderate to extreme pruritus were found to be three times more likely to have poor sleep quality. As well it has been observed that patients with poor sleep quality caused by moderate to extreme pruritus, have a higher risk of mortality [2].

Therefore, those patients require specialized nursing care, including establishment of a therapeutic and interpersonal relationship, treatment of physical symptoms and attention to the functional limitations, mental disorders and educational needs. Patient education is not just information-sharing but is an essential part of hemodialysis patients' care to improve understanding and adherence, motivate and encourage self-management; it focuses on teaching about skin hydration, nutrition, avoiding or minimizing scratching and managing complications [3].

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Significance of the Study: Uremic pruritus is a common and distressing symptom for patients with HD. It leads to many complications such as sleep deprivation, depression, negative effect on quality of life, as well increased risk of death. An Egyptian study done on hemodialysis patients mentioned that uremic pruritus was the most common cutaneous abnormality that represents 55% of patients [4]. Furthermore, a prospective study done at hemodialysis units in Egypt reported that hemodialysis patients suffered uremic pruritus with a prevalence rate of 51.6% were complaining sleep disturbances and impaired daily living activities [5].

Aim of the Study: This study aimed to evaluate impact of uremic pruritus nursing management on itching and sleep disturbance for hemodialysis patients.

Research Hypothesis: To fulfill the main aim of this study the following hypothesis were formulated:

H1: Patients who receive the uremic pruritus nursing management have a decreased intensity of itching compared to control group.

H2: Patients who receive the uremic pruritus nursing management have an improved sleep compared to control group.

MATERIALS AND METHODS

Research Design: Quasi-experimental research design was utilized in this study.

Setting: The current study was conducted in hemodialysis unit at New General Mansoura Hospital.

Subjects: A purposive sample of 80 adult male and female patients on maintenance hemodialysis, they were selected and divided randomly into two equal groups alternatively as follows:

- Group I (study group): they receive their nursing management according to ideal designed program.
- Group II (control group): they receive their nursing management according to hospital routine care.

Sampling: A total of 80 adult patients were enrolled in this study after calculating sample size through ClinCalc.com sample size calculator software, at 1% ∞ error (99.0% significance) and 5.0 β error (95.0% power of the study), the calculated sample size was 37 in each group, we can add 5.0% for better quality of data, so the sample size would be 40 in each group. They were enrolled in this study based on the following criteria:

Inclusion Criteria:

- Patients aged ranged from 21- 60 years old.
- Maintenance hemodialysis patients for 2 to 3 sessions per week.
- Patients suffered from uremic pruritus.

Exclusion Criteria:

- Patient with liver, hematological and dermatological diseases.

Tools of Data Collection: One tools was used for collection of data and achieves the aim of the study as the following:

Tool I: Structured Interview Questionnaire, it consisted of three parts as follow:

Part I: Demographic and medical data: This part of tool was developed by the researcher for collection of base line demographic and medical data such as gender, age, marital status, educational level, occupation, causes of kidney failure, duration of hemodialysis and previous exposure of uremic pruritus.

Part II: The 5-D itch scale: This tool was adopted from Elman, Hynan, Gabriel and Mayo [6]; it consists of five domains; three single-item domains (duration, degree and direction), while the fourth domain is a multiple-item domain which is the disability domain that covers effect of itching on daily activities (sleep, leisure/ social activities, housework and work/ school). The last one was the distribution domain, which assessed the affected body parts due to pruritus.

Scoring System: Total scores of the 5-D itch scale ranged from 5-25. Total score was categorized into five levels:

- No pruritus (score Up to 5).
- Mild pruritus (score more than 5 ≤ 10).
- Moderate pruritus (score more than 10 ≤ 15).
- Severe pruritus (score more than 15 ≤ 20).
- Unbearable pruritus (score more than 20 ≤ 25).

Part III: The Pittsburgh sleep quality index (PSQI) questionnaire: This tool was adopted from Carpenter and Andrykowski [7] with internal consistency (Cronbach's alpha =.69). It is an effective instrument used to measure the quality and patterns of sleep in adults. It assessed seven items: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medications and daytime dysfunction.

Scoring System: The total scores of the Pittsburgh sleep quality index itch scale ranged from 0 – 21. Total score was categorized into four levels:

- No sleep difficulty (score is zero).
- Mild sleep difficulty (score 1 ≤ 7).
- Moderate sleep difficulty (score is more than 7 ≤ 14).
- Severe sleep difficulty (score is more than 14 ≤ 21).

Validity & Reliability:

- The content validity was established for tool one part one by a panel of five expertise of professors academic nursing, who reviewed the tool for feasibility, clarity, relevance, comprehensiveness, applicability and simplicity for implementation and according to their opinion some modification were done.
- The 5-D itch scale: Reliability was tested using Cronbach's α. Convergent and concurrent validity was tested using Pearson correlation and Spearman's rho. Cronbach's α for five domains of 5D was 0, 679. There was significant strong correlation between items scores and total scores of 5D (r = 0.636 to 0.760). 5D is a valid and reliable instrument to assess pruritus symptoms on adult and geriatric patients [8].
- The Pittsburgh sleep quality index (PSQI): The original tool was developed by Carpenter and Andrykowski [7]. Internal consistency for the PSQI is (Cronbach's alpha =.69). It is an effective instrument used to measure the quality and patterns of sleep in adults.

Pilot Study: Testing of the selected tools was carried out before starting the data collection; it was applied to 10% of total number of hemodialysis patients (8) to ensure the clarity, applicability and feasibility of the tool. It helps the researcher to determine the time needed for answering the questionnaire sheet and they were excluded from total statistical analysis score. The needed correction and modifications were made.

Ethical Considerations: An Official permission was obtained from the faculty of nursing Mansoura University and responsible administrative personnel of New General Mansoura Hospital, as well as the ethical committee of Faculty of Nursing Mansoura University. Written informed consent was obtained from patients after explanation the aim of the study. Anonymity, privacy, safety and confidentiality were absolutely assured throughout the whole study. Each participant had the right to withdraw from the study at any time.

Field Work: The study was carried out through three consecutive phases: assessment, implementation and evaluation phase. The data collection period was done for six months from the beginning of January2018 to end of June 2018.

Assessment Phase: During this phase the researcher explained purpose and instruments of the study. The patients who met the sampling criteria were assessed using tool I. The needed time to complete the questionnaire was ranged from (30-40) minutes for each patient.

Implementation Phase: Each patient was interviewed individually, written colored booklet was given to memorize patient about UP nursing management. In this phase theoretical and practical content were presented in form of two sessions for a period of 30 -35minutes in each session as follows:

- First session: It was provided the patients with knowledge about kidney and its function, renal failure and hemodialysis and uremic pruritus (definition, possible causes, sites and the impact of uremic pruritus on hemodialysis patients).
- Second session: The researcher refreshed the previous given knowledge and then instructed the patent about uremic pruritus nursing management.

Evaluation Phase: In order to evaluate impact of uremic pruritus nursing management on itching severity and sleep disturbances for each patient in the study and control group was evaluated two times as follows:

- First time occurred one week after implementing nursing management.
- The second time occurred four weeks after first evaluation.

RESULTS

Table 1 represents that percentage of males and females are the same in study and control group 62.5% & 37.5% respectively. The average age in study group is 50.75 ± 8.82 compared to 51.13 ± 8.17 years in control group. Marital status is nearly the same in both groups as 65% of the study group and 62.5% of the control group were married. As regard occupational status, 87.5% of the study group and 90% of the control group were not working.

Table 2 clarifies that categories of 5_D pruritus scale at first assessment were nearly converged in both groups as 30.0% of the study group patients and 32.5% of the control group patients suffered mild pruritus. After implementing of the UP nursing management within four weeks, it was found that 47.5 % and 37.5% of study group patients suffered mild and moderate pruritus respectively, compared to 52.5% and 40% of control group patients suffered moderate and severe pruritus respectively.

Table 3 clarifies that categories of (PSQI) at first assessment were 80% of the study group patients and 65% of the control group patients suffered moderate sleep difficulty. After implementing the UP nursing management within four weeks, it was found that 45% of study group patients suffered mild and moderate sleep difficulty respectively, compared to 42.5%, 57.5% of control group patients suffered moderate and severe sleep difficulty respectively.

Table 1: Distribution of the studied subjects according to their demographic characteristics (n= 80)

		Study Group (40)		Control Group (40)		
Characters	Items	No	%	No	%	Significance test
Gender	Males	25	62.5	25	62.5	
	Females	15	37.5	15	37.5	
Age (years)	30<40	6	15.0	6	15.0	χ^2 =0.620,
	40<50	9	22.5	12	30.0	P 0.733
	50 ≤ 60	25	62.5	22	55.0	
	Mean ±SD	50.75 ± 8.82		51.13 ± 8.17		t=0.329, P0.743
Marital status	Single	3	7.5	1	2.5	χ^2 =2.253,
	Married	26	65.0	25	62.5	MEP 0.554
	Divorced	5	12.5	9	22.5	
	Widow	6	15.0	5	12.5	
Education	Illiterate	16	40.0	9	22.5	χ^2 =6.051,
	Primary	4	10.0	12	30.0	P 0.109
	Secondary	14	35.0	14	35.0	
	University	6	15.0	5	12.5	
Occupation	Not working	35	87.5	36	90.0	FET, P 1.00
	Working	5	12.5	4	10.0	

χ^2, P: $\chi^2$and P values for Chi square test

Table 2: Comparison between study subjects regarding 5_D pruritus assessment scale categories at first, second and third assessment (n= 80)

		First assessment					Second assessment					Third assessment				
		Study Group (40)		Control Group (40)			Study Group (40)		Control Group (40)			Study Group (40)		Control Group (40)		
Categories	Level	No	%	No	%	Sign. test	No	%	No	%	Sign. test	No	%	No	%	Sign. test
No pruritus	0 < 5	0	0.0	0	0.0	χ^2 =1.87*,	0	0.0	0	0.0	χ^2 =2.40*,	3	7.5	0	0.0	χ^2 =27.657**,
Mild pruritus	5 < 10	12	30.0	13	32.5	P 0.697	10	25.0	8	20.0	P 0.301	19	47.5	2	5.0	P <0.001
Moderate pruritus	10 < 15	21	52.5	18	45.0		23	57.5	19	47.5		15	37.5	21	52.5	
Severe pruritus	15 < 20	6	15.0	9	22.5		7	17.5	13	32.5		3	7.5	16	40.0	
Very severe pruritus	≥ 20	1	2.5	0	0.0		0	0.0	0	0.0		0	0.0	1	2.5	

χ^2, P: $\chi^2$and P values for Chi square test.*: Statistically significant at P ≤ 0.05. **: a highly statistically significant relation

Table 3: Comparison between study subjects regarding PSQI categories at first, second and third assessments (n= 80)

		First assessment					Second assessment					Third assessment				
		Study Group (40)		Control Group (40)			Study Group (40)		Control Group (40)			Study Group (40)		Control Group (40)		
Categories	Level	No	%	No	%	Sign. test	No	%	No	%	Sign. test	No	%	No	%	Sign. test
No sleep difficulty	0	0	0.0	0	0.0	χ^2 =2.257,	0	0.0	0	0.0	χ^2 =3.529,	2	5.0	0	0.0	χ^2 =37.66**,
Mild sleep difficulty	1 - < 7	0	0.0	0	0.0	P 0.133	3	7.5	0	0.0	P 0.212	18	45.0	0	0.0	P <0.001
Moderate sleep difficulty	7 - < 14	32	80.0	26	65.0		30	75.0	30	75.0		18	45.0	17	42.5	
Severe sleep difficulty	14 - 21	8	20.0	14	35.0		7	17.5	10	25.0		2	5.0	23	57.5	

χ^2, P: $\chi^2$and P values for Chi square test.*: Statistically significant at P ≤ 0.05. **: a highly statistically significant relation

Table 4: Correlations between average total scores of 5_D pruritus assessment scale and PSQI at first, second and third assessments *(n=80).*

	First total 5-D pruritus scale	Second total 5-D pruritus scale	Third total 5-D pruritus scale	First total PSGI score	Second total PSGI score	Third total PSGI score
First total 5-D pruritus scale		r = 0.767** *P <0.001*	r = 0.712** *P <0.001*	r = 0.794** *P <0.001*	r = 765** *P <0.001*	r = 0.505** *P <0.001*
Second total 5-D pruritus scale			r = 0.656** *P <0.001*	r = 0.718** *P <0.001*	r = 0.735** *P <0.001*	r = 0.583** *P <0.001*
Third total 5-D pruritus scale				r = 0.682** *P <0.001*	r = 0.695** *P <0.001*	r = 0.871** *P <0.001*
First total PSGI score					r = 0.916** *P <0.001*	r = 0.674** *P <0.001*
Second total PSGI score						r = 0.649** *P <0.001*
Third total PSGI score						

**Correlation is highly significant at the 0.01 level (2-tailed)

Table 5: Relation between demographic characteristics of the study group patients and average scores of 5_D pruritus itch scale and PSQI questionnaire at third assessment (n =80)

Characters	Items	No	5Ds Score Mean ± SD	PSQI score Mean ± SD
Gender	Males	25	9.80 ± 2.72	7.96 ± 2.83
	Females	15	11.40 ± 3.29	9.13 ± 3.44
Significance test			t=1.663, P0.104	t=1.169, P0.250
Age (years)	30-	6	6.50 ± 1.76	5.50 ± 0.84
	40-	9	9.22 ± 1.79	7.22 ± 2.28
	50-60	25	11.76 ± 2.69	9.52 ± 3.11
Significance test			F=13.62**, P<0.001	F=6.292*, P0.004
Smoking	No	27	9.85 ± 2.76	7.85 ± 2.76
	Yes	13	10.67 ± 3.14	8.67 ± 3.24
Significance test			t=0.804, P0.427	t=0.784, P0.438

t, P: t and P values for student t-test. F, P: F and P values for ANOVA test

*: Statistically significant at P=0.05. **: a highly statistically significant relation

Table 4 reveled that there was a significant, positive and strong correlation between first, second and third assessments of 5_D pruritus and PSQI scores over intervals of examination (P <0.001).

Table 5 showed that female patients had a higher average score 5_D itch scale and PSQI scores than male patients with no significant difference between them. As regard age it was found that high scores of 5_D itch scale and PSQI questionnaire was found in the high age category than young one. In addition, it was found that smoker patients had a higher average scores of 5_D pruritus and PSQI compared to non-smoker patients, with a significant difference between them.

DISCUSSION

Hemodialysis patients who are suffering UP need for multidisciplinary approach for uremic pruritus management in which nurses have an important, primary responsibility in providing management for those patients. Thus, it's crucial to conduct the study to evaluate the impact of providing uremic pruritus nursing management on itching and sleep disturbance for hemodialysis patients.

Results of the current study revealed that near two thirds of study subjects were males ranged between age of thirty and sixty years old, the mean age for study and control group was 50.75 ± 8.82 and 51.13 ± 8.17 respectively and more than half of them were married. These finding are in agreement with Ahmed, Yassine, Tawafe and Ebazaway [9] who stated that the mean age was 51.34±13.5 years. While in relation to occupation it was noticed that majority of the study subjects were unemployed. This is on line with Shdaifat and Manaf [10] who found that majority of study sample were not working.

In researcher point of view, majority of patients are unemployed due to nature of disease as patients had to receive dialysis three times a week, each session lasting for four hours, in addition to physiological, psychological changes that affect physical, mental and social abilities of those patients to perform tasks of their job.

According to results of the current study, it was noticed that there was no significant difference between study and control groups before implementing the UP nursing management While after implementing the nursing management it was found that there was a high statistical significant difference between study and control group as study group patients had lower average total score of the 5_ D itching assessment scale and its sub items comparing to control group patients.

From researcher point of view, these positive changes and decreasing levels of uremic pruritus among study group patients is coming back to applying the uremic pruritus nursing management that include taking soothing bath, using skin lotions, change patient dietary, life style modification and taking medications that decrease itching. In the same line; Karadag, Kilic, Karatay and Metin [11] realized that administration of moisturizing skin oils had positive effects on itching, quality of life and sleep quality among hemodialysis patients who had itching complaints. In the same way Lin *et al*. [12] confirmed that, moisturizing lotions and cooling soothing agents is a simple, safe, inexpensive and easily administered treatment for itchy skin in hemodialysis patients that lead to preventing or reducing uremic pruritus.

According to results of the current study, it was noticed that majority of study and control group patients had moderate sleep difficulty before implementing the UP nursing management. While after implementing it, nearly half of study group patients had mild sleep difficulty and more than half of control group patients had severe sleep difficulty.

These results are in accordance with So, Kim and Kim [13] who mentioned that pruritus intervention program decreased pruritus severity and increased sleep satisfaction in hemodialysis patients. Similarly, another study done by Mathur, Lindberg, Germain, Block, Tumlin and Smith [14] reported that sleep quality is correlated with itching, whereas, decreasing itch severity improves patients' quality of sleep.

From researcher point of view, sleep quality was improved in study group patients comparing to control group patients due to decreasing level of uremic pruritus and itching in the study group patients, as there was a clear relationship between decreasing pruritus level and improvement of the sleep quality among study group patients, as it was noticed in our study that there is a significant and strong positive correlation between UP and sleep quality.

Findings of the current study were indicated a significant, positive and strong correlation between 5_D pruritus scale and PSQI scores among HD patients over intervals of examination. Similarly, results obtained by Trbojeviæ-Stankoviæ *et al.* [15] found a significant correlation between sleep quality and UP among HD patients. Similarly, in a study done by Weiss *et al.* [16]more than half of hemodialysis patients reported difficulties with falling asleep more than once a week due to itch or pruritus, with the findings suggesting that impaired quality of sleep was significantly associated with pruritus and its severity.

Results of the current study showed that female was associated with a higher 5_D itch scale scores and PSQI questionnaire, parallel to findings of Ibrahim, Elshahid, El Baz, Elazab, Elhoseiny and Elsaie [1] who realized that female patients have a higher prevalence of itching than male patients. Also, Ständer, Stumpf, Osada, Wilp, Chatzigeorgakidis and Pfleiderer [17] examined gender differences in chronic pruritus and observed that female patients had higher uremic pruritus scores than male patients.

In the same line, Hung *et al.* [18] study which was reported that self-reported sleep quality and metabolic

syndrome and suggested that female gender was associated with poor sleep quality than males. As well Masoumi, Naini, Aghaghazvini, Amra and Gholamrezaei [19] researched sleep quality in patients on maintenance hemodialysis and mentioned that female HD patients suffered sleep disturbances more than male patients.

Furthermore, our study revealed that, there was a significant relation between age and scores of 5_D itch scale and PSQI questionnaire as increasing patients' age is accompanied with increasing scores of 5_D itch scale and PSQI questionnaire. From researcher point of view, this happened due to dermatological physiologic changes that happened in relation to increasing patient age. This is in accordance with Rehman, Munib, Ramadas and Khan [20] who mentioned that there is a positive association between pruritus and age of patients, as increasing patient age leads to increase itching level. In the same line, many studies associated increasing patient age to the low quality of sleep in patients under chronic hemodialysis. Also, Weiss, Mettang, Tschulena, Passlick-Deetjen and Weisshaar [16] and Einollahi, Motalebi, Rostami, Nemati and Salesi [21] mentioned that patients had a lower quality of sleep with increasing age.

Regarding to smoking, results of the current study indicated that smokers had higher scores of pruritus than non-smokers, in researcher point of view it may be due to effect of smoking on skin as it decreases blood supply to extremities and have a vasoconstrictive effect on other body parts that increasing itch severity in those patients. This result is in accordance with Lee *et al.* [22] mentioned that exposure to cigarette smoking may contribute cumulatively to the development of adult-onset dermatitis. Furthermore, Freiman *et al.* [23] mentioned that smoking is strongly associated with numerous dermatologic conditions as it decreases the cutaneous blood flow.

CONCLUSIONS

The study concluded that, hypothesis of the current study was accepted as patients who received the uremic pruritus nursing management had a decrease in their itching severity and improvement in their sleep quality.

- Written, colored booklet about uremic pruritus nursing management should be provided for hemodialysis patients.
- Encourage patient adherence to uremic pruritus treatment regimen.
- Further similar researches to be conducted in other hospitals with larger samples to obtain more generalization of the results.

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