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Effect of Sleep Hygiene Teaching Protocol on Quality of Sleep among Hemodialysis Patients

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Abstract: **Sleep hygiene is focused on the development of sleep routines that are focused on promoting habits, patterns, behaviors, and environmental factors. This study aimed to assess effect of sleep hygiene teaching on quality of sleep among hemodialysis patients. Research design: This study is a quazi experimental (pre –post- test) research design. Sample: sixty adult patients undergoing regular hemodialysis, their age range between (18- 65) from both sexes and are willing to participate in the study. Setting: The study was conducted in Hemodialysis Unit at Assiut University Hospital. Tools: two tools were used: Interview structured questionnaire sheet and Sleep Quality Scale. Results: There were a statistical significant difference between total scores of sleep quality pre and post-test (after one month, two and after three months) after implementing sleep hygiene teaching (P=0.001). Conclusion: sleep hygiene teaching protocol were effective in improving quality of sleep for hemodialysis patients. Recommendation: In-service training programs related to sleep hygiene teaching for hemodialysis patients must be frequently conducted in the unit to continuously maintain and improve sleep quality.**

Keywords: **Hemodialysis, Sleep, Sleep Hygiene Teaching, Sleep Quality.**

1. INTRODUCTION

Sleep is a natural periodic state of rest for the mind and body, in which the eyes usually close and consciousness is completely or partially lost, so that there is a decrease in bodily movement and responsiveness to external stimuli**(Ferri, et al., 2008) and (William, 2016)**

Sleep is a basic physical requirement for maintaining mental and physical health, whose duration varies between 6 and 10 hours a day and can be influenced by emotional and general lifestyle factors. Poor Sleep Quality (SQ) can disturb patient's emotions, thoughts and motivation causing tiredness, difficulty to concentrate, loss of appetite, nervousness, anxiety and depression. **(Koch et al., 2009)**

Sleep disorder is a condition characterized by disturbed sleep-related pattern or behaviors. The prevalence of sleep-related problems and disorders is high in patients with end-stage renal disease, particularly sleep apnea, restless legs syndrome, and overall poor sleep quality **(Plantinga et al., 2011**)

Patients may suffer from various sleep disorders including dipsomania such as insomnia, hypersomnia, narcolepsy and sleep apnea; parasomnias such as sleep walking and rapid eye movement, behavior disorder and sleep rhythm disorders. **(Randall and David, 2016)**

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Sleep disorders have appeared as an important health hazard and some of the factors involved in the pathogenesis of renal disease are the same that cause or are associated with sleep apnea. **(Martin, 2011)**.The factors contributing to sleep disturbances in patients on dialysis have been classified as treatment related (e.g. premature discontinuation of dialysis, rapid changes in fluid and electrolyte and acid base balance, alteration in medications, dialysis shift); psychological (e.g. anxiety, depression, stress and worry); disease related (e.g. anemia, uremia and metabolic changes); life style related (e.g. excess coffee, smoking, poor sleep hygiene). **(Merlino, et al., 2015)**

Also sleep disorders are highly prevalent in hemodialysis patients, intensifying their individual and social problems to some extent despite many investigations on the prevalence of sleep disorders in hemodialysis patients (HD) and the associated factors, interventional approaches to improve sleep quality in hemodialysis patients have been explored much less frequently. In this study, we seek to take a step to improving sleep quality in hemodialysis patients through face-to-face sleep health education **(Giordano et al., 2015)**

Using non-pharmacological interventional therapies such as behavioral approaches sleep restriction therapy, stimulus control, adherence to sleep hygiene behaviors, relaxation techniques, biofeedback, guided imagery, and cognitive approaches, may overcome many prevalent sleep disorders. “Sleep hygiene” refers to those behaviors that are believed to promote improved quantity and quality of sleep **(Nishinoue et al., 2012)**

Sleep quality is defined subjectively as one's perception of falling asleep easily, getting sufficient duration so as to wake up felling rested, and making it through their day without experiencing excessive day time sleepiness **(Unruh, et al., 2014).**

Sleep hygiene teaching include instructions about health practice and environmental factors that can be beneficial for maintaining sufficient sleep and also details regarding homeostatic drive for sleep and the effect of drugs and habits prior to sleep**.** In this study, we seek to take a step to improving sleep quality in hemodialysis patients through face – to – face sleep health education **(Sato et al., 2010).**

Significance of the study

From the researcher's clinical experience it has been observed that a lot of hemodialysis patients are in need for sleep hygiene teaching to improve quality of sleep. Therefore, this study will be the first in this geographical location which will help such group of patients to maintain healthy sleep.

Aim of the study:

The aim of this study was to assess the effect of sleep hygiene teaching on quality of sleep among hemodialysis patients.

Research hypothesis:

To fulfill the aims of this study the following hypothesis was formulated: Patient that were received sleep hygiene teaching protocol will be show higher scores in quality sleep level than pre implementation of teaching protocol.

Patients and method:

Technical Design:

The technical design included research design, setting of the study, subjects, and tools for data collection.

Research design:

Quazi experimental (pre –post test) research design was used in this study.

Sample:

Sample of (60) adult patients on regular hemodialysis, their age range between (18- 65) from both sexes and were willing to participate in the study.

According to sample size formula the sample was (60) patients undergoing hemodialysis was selected by using the following equation according to **Steven. and Thompson (2012).** N=total patient population size of (120) patients who undergoing regular hemodialysis at Assiut University Hospitals. During sessions by n=120 of hemodialysis patients during sessions. Z= confidence levels is 0.95 and is equal to 1.96.

D = the error ratio is = 0.05 P= the property availability ratio and neutral = 0.50. Respiratory disease patients and heart failure patients were excluded.

Setting:

The study was conducted in Hemodialysis Unit at Assiut University Hospital.

Exclusion criteria:

1. Respiratory disease patients.
2. Heart failure patients.

Tools

Three tools were utilized in this study

Tool (I): A structured interview questionnaire sheet:

This sheet was developed by the researcher based on references and consisted of two parts:

Part 1: A- Demographic data included of (6) items covering the following (age, sex, marital status, level of education, occupation and residence).

B- Patient habits it included (6) items covering the following (smoking, drinking coffee or tea before sleep, taking medication for sleep, watching television, eating heavy meals before sleep and doing exercise before sleep).

C- Medical history of hemodialysis patients it included of (3) items covering the following (duration of dialysis, times of sessions per week and number of hours per session).

Part 2: Patient assessment sheet: to assess the patient's:

A- Physical status that was composed of (13) items; (dyspnea, fever, sweating, nausea, pain, vomiting, itching, cough, restless legs, headache, snoring, dry throat and fatigue).

B- Psychological status that was composed of (6) items. (feeling uncomfortable, health condition taking up too much of patient thinking, patient hide the nature of illness, insomnia and lost felling of good include irritability , tense and depression mood)

C- Environmental disturbance was composed of (5) items : (if light or noise in the room interfering with quality of sleep and room temperature, hours of stay in bed without sleep, hours of sleep in the day and sleep disturbance such as waking during sleep, polyuria, time of session napping thinking in nature of disease, numbness ….etc.)

Tool (II): Sleep Quality Scale (SQS) developed by **(Howell et al., 2008)** consisting of (28) items, the SQS evaluate six domains of sleep quality: daytime symptoms, restoration after sleep, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction**)**.

Scoring system:

Using a four point, Likert - type scale, respondents indicate how frequently they exhibit certain sleep behaviors (0="Rarely or few," 1="some times," 2="often," 3="almost always").which every of them mean that: Rarely: None or 1-3 times a month, sometimes: 1-2 times a week, often: 3-5 times a week and almost always: 6-7 times a week. Scores on items belong to factors 2and 5(restoration after sleep and satisfaction with sleep) and are reversed before being tallied. Total scores can range from 0 to 84, with higher scores denoting more acute sleep problems.

Sleep hygiene teaching to improve quality of sleep; it included of(17) items:

Get up every day at the same time, including week ends, avoid taking day time naps, Avoid heavy meals within two hours before going to sleep, avoid the use of caffeinated products, nicotine, and alcohol especially later in the day, maintain appropriate environmental conditions for sleep, avoid stressful activities within a few hours before going to sleep (i.e. Avoid noisey environments), pursue regular physical activity such as walking, but avoid vigorous exercise within a few hours before going to sleep, take a bath in body temperature water to relax and avoid any activities (watching TV,…… etc.).

-Reassessment after application of sleep hygiene teaching after (one month, two months and after three months) by using sleep Quality scale (SQS).

Operational Design:

Technique for data collection:-

This study was carried out in three phases:

Phase1:-Preparatory phase:

The researcher reviewed related literature of the current study, local & international, using text books, articles, and scientific magazines. The proposed study setting was assessed for the number of patients in Hemodialysis Unit at Assiut University Hospital. This phase ended by a pilot study.

Content validity:

The content validity of study tools was checked by 3 expert professors in the field of nursing and medicine; they reviewed the instruments for clarity, relevance, comprehensiveness, understanding, applicability and easiness.

A pilot study:

A pilot study was carried out in April (2018) to test the feasibility and practicability of the study tools and conducted on10% of the sample (6 patients). It had also provided an estimate of time needed to fill out the tools. The purpose of pilot study was to:

- Ascertain the relevance of the tools.
- Detect any problem improper to the statements clarity that might interfere with the process of data collection.
- Estimate the time needed to complete the interview schedule.

Phase2:-Planning phase:

Based on findings of the preparatory phase, the designed sleep hygiene teaching protocol was developed by the researchers, after extensive literature review considering patients' needs and their levels of understanding.

Phase3:-Implementation phase: (The designed sleep hygiene teaching protocol):

- Data were collected from Hemodialysis Unit at Assuit University Hospital for 9 months during the period from April (2018) to December 2018. The study was carried out at morning and afternoon shifts for all available patients.
- At initial interview the researcher introduced herself to initiate line of communication, explained the nature and purpose of the designed sleep hygiene teaching protocol to the selected patients who were willing to participate in the study and filled out the questionnaire sheet Tool (1) to assess patients knowledge before application of the designed teaching protocol and scheduled with them the teaching sessions.
- Then sleep quality was assessed by using Sleep Quality Scale (SQS) Tool (2) that was filled through the researcher. Patients received the contents of designed sleep hygiene teaching by the researcher herself. Patients was divided into small groups, each contain of (2-3 patients).
- The designed sleep hygiene teaching protocol was conducted through (6 sessions) the duration of each session was around 30 to 40 minutes include 10 minutes for discussion and feedback.
- Each of the following session usually started by a briefing about what had been discussed in the previous session, using simple Arabic Language. Each session ended by a summary of what has been taught during the previous session and the objectives of new topics. Feedback and reinforcement of designed sleep hygiene teaching protocol was performed according to patients needs to ensure their understanding.
- The first interview was used to assess the patient using Tool (1). The (second) interview was done used Sleep Quality Scale (SQS) to assess quality of sleep of the patient using Tool (2). The (Third) was done used to implementing the theoretical part of the designed sleep hygiene teaching for patients. The (fourth) after one month was done to assess the

effectiveness of the designed sleep hygiene on quality of sleep using Tool (2).The (fifth) after two months was done to assess the effectiveness of the designed sleep hygiene on quality of sleep using Tool (2). The (sixth) interviews after three months were done to assess the effectiveness of the designed sleep hygiene on quality of sleep using Tool (2).

- The last phase of the designed sleep hygiene teaching protocol is the evaluation phase during this phase, an evaluation of the effectiveness of the designed sleep hygiene teaching on quality of sleep in hemodialysis patients was done through reassessing the patients Quality of sleep pre and post implementing of designed sleep hygiene teaching using Tool (2) after (one, two and three months) from protocol implementation.

- **Administrative Design**:

An official Permission to carry out the study was obtained from the responsible hospital authorities of the Hemodialysis Unit at Assiut University Hospital.

Ethical considerations:

1. Research proposal was approved from Ethical Committee in the faculty of nursing.
2. There is no risk for study subject during application of research.
3. The study was following common ethical principles in clinical research.
4. Oral consent was obtained from patients or guidance who are willing to participate in the study, after explaining the nature and purpose of the study.
5. Confidentiality and anonymity will be assured.
6. Study subject have the right to refuse to participate and or withdraw from the study without any rational any time.
7. Study subject privacy was considered during collection of data.

The statistical design:

The data obtained had reviewed, prepared for computer entry, coded, analyzed and tabulated, Descriptive statistics include (frequencies and percentages, mean and standard deviation) use Pearson chi- square (cross tabulation) between pre, and post-test after one month, two months and after three months, correlation and one way a nova test were done using computer program (SPSS).

2. RESULTS

Table (1): Distributions of demographic characteristics for the study sample (n=60)

Variables	No	%
Age (years)		
18-30	9	15.0
30-40	22	36.7
40-50	9	15.0
50-65	20	33.3
Sex		
Male	30	50.0
Female	30	50.0
Marital status		
Single	11	18.3
Married	47	78.3
Widow	2	3.3
Educational level		
Illiterate	11	18.3
Read and write	12	20.0
Primary	10	16.7

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Secondary	21	35.0
Higher education	6	10.0
Occupation		
Work	13	21.7
Not work	47	78.3
Residence		
Urban	20	33.3
Rural	40	66.7

Table (1): Reveals that there was equal percentage for male and female of the studied sample, the highest percentage of the studied sample (78.3%) were married, their age ranged from (30 to 40) years old (36.7%), regarding level of education (35%) were having secondary school, also the majority of them were not working (78.3%), and living in rural (66.7%) .

Table (2): Percentage distribution regarding medical data for the study sample (n=60).

Variables	No	%
Assessment of medical history		
Duration of hemodialysis		
one year	4	6.7
Two years	3	5.0
Three years	4	6.7
More than three years	49	81.7
How many time of session per week		
Two time	2	3.3
Three time	57	95.0
More than three time	1	1.7
How many hours per session		
Three hours	7	11.7
Four hours	53	88.3

Table (2): Reveals that regarding medical data of the studied sample the highest percentage of them were receiving hemodialysis more than three years (81.7%), the majority of them were receiving 3 sessions of hemodialysis per week (95%); and the highest percentage of them wear receiving hemodialysis for 4 hours per session (88.3%).

Table (3): Percentage distribution regarding patients habits of the study sample (n=60)

Variables	Yes		No	
	N	%	N	%
Assessment of patient habits				
Smoking	11	18.3	49	81.7
Drinking coffee or tea before sleep	31	51.7	29	48.3
Taking medication for sleep	4	6.7	56	93.3
Watching television	47	78.3	13	21.7
Eating heavy meals before sleep	17	28.3	43	71.7

Table (3): Reveals that regarding distribution of patient habits for the study sample the majority of them (78.3%) were watching television, half of them were drinking coffee or tea before sleep (51.7%), the third of them were eating heavy meals before sleep (28.3%) and less than third of the studied sample were smoking (18.3%).

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Table (4): Percentage distribution regarding assessment of patient's physical, psychological status and sleep environment for the study sample (n=60).

Variables	Yes		No	
	N	%	N	%
A- Patient physical status assessment:-				
Pain	13	21.7	47	78.3
Nausea	11	18.3	49	81.7
Vomiting	16	26.7	44	73.3
Sweating	33	55.0	27	45.0
Dyspnea	26	43.3	34	56.7
Itching	32	53.3	28	46.7
Cough	6	10.0	54	90.0
Restless legs	18	30.0	42	70.0
Headache	39	65.0	21	35.0
Dry throat	39	65.0	21	35.0
Fatigue	29	48.3	31	51.7
B- Patient psychological status assessment:-				
Feel uncomfortable	21	35.0	39	65.0
thinking of health condition	19	31.7	41	68.3
Hide nature of illness from others	7	11.7	53	88.3
Feel of insomnia or scared	51	85.0	9	15.0
C-Assessment of patient sleep environment:-				
Dark light during night	51	85.0	9	15.0
Too hot temperature	40	66.7	20	33.3
Too cold temperature	0	0	60	100.0
Quiet room	14	23.3	46	76.7
Noises room	46	76.7	14	23.3

Table (4): Reveals that regarding assessment of patient's physical status of the studied sample the majority of them (65%) were suffering from headache and dry throat ,the half of them had sweating and itching (53%), more than third of them had dyspnea (43%), restless legs (30%). As regarding patient's psychological status the highest percentage were feeling of insomnia (85 %), more than third of them were uncomfortable (35%) and the third of them were thinking in disease (31.7%) as regarding patient's sleep environment disturbance the majority of them were having dark light during night (85 %) and having noises room (76.7%), the half were suffering from too hot temperature (66.7 %).

Table (5): Percentage distribution regarding sleep time for the study sample (n=60)

Variables	No	%
How many hours do you stay in bed without sleep		
Not take time	9	15.0
From quarter to half an hour	28	46.7
From half to an hour	12	20.0
More than an hour	11	18.3
How many hours you sleep in day		
Less than 4 hour	28	46.7
From 4 to 6 hour	10	16.7
From 6 to 8 hours	16	26.7
More than 8 hour	6	10.0

Table (5): Illustrate that regarding sleep time of the studied sample, the hours of stay in bed without sleep the majority of them (46.7%) were taken from quarter to half an hour, third of them need from half to an hour (20%) and less than third stay more than an hour (18.3%). And regarding hours of sleep in day the majority of them were sleep less than 4 hours (46.7%) . the third of them sleep from 6 to 8 hours (26.7%) and less than third sleep from 4 to 6 hours (16.7%).

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Table (6): Comparison between quality of sleep for hemodialysis patient's pre and post-test (after one month, two and three months) (n=60)

Sleep quality scale	Pre		After one month		After two month		After three month		P .v
	N	%	N	%	N	%	N	%	
Patient have difficult in falling asleep									
Rarely	2	3.3	4	6.7	52	86.7	60	100.0	0.001
Sometimes	27	45.0	44	73.3	8	13.3	0	0.0	
Often	18	30.0	11	18.3	0	0.0	0	0.0	
Almost always	13	21.7	1	1.7	0	0.0	0	0.0	
Patient fall into a deep sleep									
Rarely	7	11.7	11	18.3	50	83.3	60	100.0	0.001
Sometimes	25	41.7	42	70.0	10	16.7	0	0.0	
Often	21	35.0	6	10.0	0	0.0	0	0.0	
Almost always	7	11.7	1	1.7	0	0.0	0	0.0	
Patient wake up while sleeping									
Rarely	4	6.7	7	11.7	46	76,7	60	100.0	0.001
Sometimes	15	25.0	42	70.0	14	23.3	0	0.00	
Often	19	31.7	11	18.3	0	0.0	0	0.0	
Almost always	22	36.7	0	0.0	0	0.0	0	0.0	
Patient have difficulty getting back to once 1 wake up middle of the night									
Rarely	4	6.7	11	18.3	35	58.3	60	100.0	0.001
Sometimes	9	15.0	39	65.0	25	41.7	0	0.00	
Often	16	26.7	10	16.7	0	0.00	0	0.00	
Almost always	31	51.7	0	0.00	0	0.00	0	0.00	
Patient wake up easily because of noise									
Rarely	6	10.0	13	21.7	36	60.0	56	93.3	0.001
Sometimes	5	8.3	41	68.3	24	40.0	4	6.7	
Often	10	16.7	5	8.3	0	0.0	0	0.0	
Almost always	39	65.0	1	1.7	0	0.0	0	0.0	
Patient never go back to sleep after awakening during sleep									0.001
Rarely	1	1.7	18	30.0	46	76.7	60	100.0	
Sometimes	15	25.0	31	51.7	14	23.3	0	0.00	
Often	27	45.0	10	16.7	0	0.0	0	0.0	
Almost always	17	28.3	1	1.7	0	0.0	0	0.0	

Chi-Square Tests *=Significant difference, *p≤0.05 **= highly significance, *p≤0.01 Ns= Non significant difference

Table (6): Show that there was a highly statistically significant difference in quality of sleep regarding difficulty falling sleep, fall into deep sleep, wake up while sleeping, difficulty getting back once wake up middle of the night, wake up easily because of noise, toss and turn, go back to sleep after wakening during sleep and fell refreshed after sleep in the pre post-test (after one month, two and three months) for the study sample with a p. value = 0.001.

Table (7): Comparison between quality of sleep for hemodialysis patient's pre and post-test (after one month, two and three months) (n=60)

Sleep quality scale	Pre		After one month		After two month		After three month		p.v
	N	%	N	%	N	%	N	%	
Poor sleep causes patient headache									
Rarely	5	8.3	19	31.7	48	80.0	52	86.7	0.001
Sometimes	11	18.3	32	53.3	12	20.0	8	13.3	
Often	11	18.3	9	15.0	0	0.0	0	0.0	
Almost always	33	55.0	0	0.0	0	0.0	0	0.0	
Poor sleep makes patient irritated									
Rarely	6	10.0	14	23.3	50	83.3	59	98.3	0.001

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Sometimes	9	15.0	33	55.0	10	16.7	1	1.7	
Often	15	25.0	11	18.3	0	0.0	0	0.0	
Almost always	30	50.0	2	3.3	0	0.0	0	0.0	
Poor sleep makes patient loss interest in work or others									
Rarely	4	6.7	9	15.0	42	70.0	58	96.7	0.001
Sometimes	9	15.0	39	65.0	18	30.0	2	3.3	
Often	13	21.7	11	18.3	0	0.0	0	0.0	
Almost always	34	56.7	1	1.7	0	0.0	0	0.0	
Poor sleep makes hard for patient to think									
Rarely	4	6.7	15	25.0	50	83.3	54	90.0	0.001
Sometimes	7	11.7	38	63.3	10	16.7	6	10.0	
Often	14	23.3	7	11.7	0	0.0	0	0.0	
Patient fatigue is relived after sleep									
Rarely	2	3.3	13	21.7	41	68.3	55	91.7	
Sometimes	10	16.7	38	63.3	19	31.7	5	8.3	
Often	24	40.0	8	13.3	0	0.0	0	0.0	0.001
Almost always	24	40.0	1	1.7	0	0.0	0	0.0	
Poor sleep causes patient to make mistakes at work									
Rarely	3	5.0	13	21.7	43	71.7	58	96.7	
Sometimes	11	18.3	35	58.3	17	28.3	2	3.3	0.001
Often	12	20.0	10	56.7	0	0.0	0	0.0	
Almost always	34	56.7	2	3.3	0	0.0	0	0.0	

Chi-Square Tests *=Significant difference, *p≤0.05 **= highly significance, *p≤0.01 Ns= Non significant difference

Table (7): Demonstrated that there was a highly statistically significant difference in quality of sleep as regarding; poor sleep causes headache, poor sleep makes patient irritated**,** poor sleep makes hard for patient to think, poor sleep makes lose interest in work, and poor sleep causes patient to make mistakes at work in the pre post-test (after one month, two and three months) for the study sample with a p. value = 0.001.

Table (8): Comparison between quality of sleep for hemodialysis patient's pre and post-test (after one month, two and three months) (n=60)

Sleep quality scale	Pre		After one month		After two month		After three month		P .v
	N	%	N	%	N	%	N	%	
Poor sleep makes patient forget things more easily									
Rarely	5	8.3	10	16.7	42	70.0	59	98.3	0.001
Sometimes	14	23.3	38	63.3	18	30.0	1	1.7	
Often	9	15.0	10	16.7	0	0.0	0	0.0	
Almost always	32	53.3	2	3.3	0	0.0	0	0.0	
Poor sleep makes patient hard to concentrate at work									
Rarely	1	1.7	10	16.7	44	73.3	55	91.7	0.001
Sometimes	9	15.0	42	70.0	16	26.7	5	8.3	
Often	19	31.7	7	11.7	0	0.0	0	0.0	
Almost always	31	51.7	1	1.7	0	0.0	0	0.0	
Sleepiness interferes with patient daily life									
Rarely	2	3.3	13	21.7	42	70.0	59	98.3	0.001
Sometimes	8	13.3	38	63.3	18	30.0	1	1.7	
Often	20	33.3	9	15.0	0	0.0	0	0.0	
Almost always	30	50.0	0	0.0	0	0.0	0	0.0	
Poor sleep makes patient lose desire in all things									
Rarely	2	3.3	6	10.0	44	73.3	60	100.0	0.001
Sometimes	10	16.7	46	76.7	16	26.7	0	0.0	
Often	25	41.7	8	13.3	0	0.00	0	0.00	
Almost always	23	38.3	0	0.0	0	0.00	0	0.00	

Poor sleep makes patient life painful									
Rarely	1	1.7	3	5.0	52	86.7	60	100.0	0.001
Sometimes	9	15.0	57	95.0	8	13.3	0	0.0	
Often	14	23.3	0	13.3	0	0.00	0	0.00	
Almost always	36	60.0	0	0.0	0	0.00	0	0.00	
Poor sleep makes patient easily tired at work									
Rarely	1	1.7	14	23.3	47	78.3	57	95.0	0.001
Sometimes	10	16.7	42	70.0	13	21.7	3	5.0	
Often	18	30.0	4	6.7	0	0.0	0	0.0	
Almost always	31	51.7	0	0.0	0	0.0	0	0.0	

Chi-Square Tests *=Significant difference, *p≤0.05 **= highly significance, *p≤0.01 Ns= Non significant difference

Table (8): Demonstrated that there was a highly statistically significant difference in quality of sleep as regarding poor sleep makes forget thing more easily, hard to concentrate at work, interfere with daily life, poor sleep makes patient life painful and poor sleep makes patient easily tired at work in the pre and post-test (after one month, two and three months) for the study sample with a p. value = 0.001

Table (9): Comparison between total score of sleep quality pre and post-test (after one month, two and three months) for the study sample (n=60)

Variables	Pre-test		After one month		After 2month		After3month		P.V
	N	%	N	%	N	%	N	%	
Satisfied	5	8.3	43	71.7	60	100	60	100	0.001
Unsatisfied	55	91.7	17	28.3	0	0.0	0	0.00	

Chi-Square Tests *=Significant difference, *p≤0.05 **= highly significance, *p≤0.01 Ns= Non significant difference

Table (9): Revealed that; there was a highly statistically significant difference between total score of sleep quality scale pre and post-test (after one month, two and three months) for the study sample after sleep hygiene teaching (p. value=0.001).

3. DISCUSSION

Hemodialysis is associated with an increased prevalence of sleep disturbance. Which have a major influence on vitality and general health of patients **(Parker, 2015)**

Sleep hygiene education is the first line treatment for sleep disorders. Increased demand for sleep of higher quality is a global concern, which is more urgent for hemodialysis patients. Despite the fact that education contribute positively to changing behavior **(Martinez, et al., 2014).** Sleep hygiene involves basic education on have the sleep environment, caffeine, alcohol, nicotine, food and exercise which affect sleep. **(Smith, et al., 2011)**

The present study revealed that, the majority of the studied patients were married, more than half of them wear living in rural area and their age ranged from (30 to 40) years old. These results agree with **(Maryam, et al., 2014)** who found that the majority of the participants were married, the mean age of the participants was 45.12+ 15.86 years. And with **(Tel &Esmek., 2012)** who found that more than half of the patients were from rural areas.

The current study revealed that regarding distribution of the patients habits for the study sample the majority were watching television and half of them drink coffee or tea before sleep. This result agree with **(Elizabeth & Cespedes., 2014)** who found that greater television viewing and bedroom television were associated with decreased sleep duration. And agree with **(Exelmans, et al., 2017)** who found that watching or regular viewing before bed affect on sleep. And also agree with **(Clark & Landolt, 2017)** who found that sleep complaints high in patient with increased caffeine intake and led to prolonged sleep latency, shorter total sleep time, worsening of perceived sleep quality, increased light sleep and shortening deep sleep time as well as frequent awakening.

The study showed that the majority of the study sample regarding medical data was receiving hemodialysis more than three sessions per week, the highest percentage of them receive hemodialysis more than three years and the majority were receiving dialysis for four hours per session. This result agree with **(Maryam, et al., 2014)** who found that all

participants were receiving hemodialysis 3 times on week and agree with **(Sabet, et al., 2012)** who found that the prevalence of sleep disorder is much higher among long term dialysis patients.

According to this study, it was observed that regarding physical status assessment the majority of the studied patients were suffering from headache and dry throat and more than half of them were suffering from sweating and itching. These results agree with **(Hanly. 2009)** who found that medical factors that affect on sleep including pain, discomfort, headache and neurological disorder. Also his study demonstrated that comorbidities are independent predictors of sleep disturbance in patient on dialysis.

Regarding to psychological status the present study showed that the majority of the study sample feels of insomnia or scared and regarding to the effect of sleep on mood the half of the study sample were tense. This result agree with **(Berger et al., 2009)** who found that approximately 50% of patients with chronic end stage renal disease undergoing hemodialysis have insomnia and other sleep disorders.

And with **(Merlino, et al., 2011)** who found that the highest prevalence of sleep disorders is common in patients with end stage renal disease.

Regarding sleep environment disturbance, our study revealed that the majority of the studied sample were having noises room and were having dark light during night and one third of them were suffering from too hot temperature. This result agree with **(Edalat., et al., 2013)** who found that 70% of patients with ESRD who were undergoing hemodialysis presented with a propensity to sleep in inappropriate circumstances.

The result of the present study illustrated that the majority of the study sample stayed in the bed without sleep from quarter to half an hour and sleep from 4 to 6 hours in day. This result agree with **(Farzaneh, 2011)** who found that majority of the patients complained of having difficulty falling sleep, shorter sleep duration and less efficient sleep.

The current study demonstrated that regarding to causes of sleep disturbance of the studied patients less than half of them were irritable and tense, two thirds of them had dyspnea and third of them were thinking in nature of disease and less than third of them were having pain, fatigue and restless legs. This result disagree with **(Kolla, et al., 2011)** who found that pain and physical discomfort was the top reason for interrupted sleep. And with **(Tanaka, &Tamura, 2015)** who found that the most prominent sleep disorder among hemodialysis patients are sleep apnea, restless leg syndrome and insomnia.

Finally, this study indicated that the quality of sleep improved after the training intervention. The post analysis indicated highly significant differences in the scores for SQS and between pre and post-test indicating the effect of sleep hygiene teaching on improvement of sleep quality in hemodialysis patients. This is agreement with **(Kakinum., et al., 2010) and (Nishinone ., et al., 2012)** who confirmed that the contribution of sleep hygiene education to improve sleep quality in hemodialysis patients. And with **(Berger, et al., 2009)** who found that the mean scores of each component of sleep quality were significant lower than those before sleep hygiene education in hemodialysis patients.

4. CONCLUSION

According to the result of this study, sleep hygiene teaching has a favorable effect on sleep quality of hemodialysis patients. Sleep hygiene improve various components of sleep quality. Sleep hygiene could be taught as a useful method to improve the sleep quality of patients in the hemodialysis unit.

5. RECOMMENDATIONS

In the light of the findings of the current study the following recommendations were suggested:-

Recommendation for patients:

1- Developing strategies aimed to improve quality of sleep for hemodialysis patients.

2- Studying the factors that affect sleep quality on hemodialysis patients.

3- In-service training programs related to sleep hygiene teaching for hemodialysis patients must be frequently conducted in the unit to continuously maintain and improve sleep quality.

Recommendations for future researches:

1- A systematic review of the current evidence on the effect of sleep hygiene teaching on improving quality of sleep.

2- Further researches should be done on a large sample to generalize the results of the study.

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