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The Effect of Sleep Hygiene Measures and Home Remedies on Minimizing the Insomnia and Restless Leg Syndrome among Hemodialysis Patients

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Abstract: ***Background:*** *The majority of dialysis patients complain from restless leg syndrome and how it negatively affects their sleep causing sleep disturbance and insomnia.*
Aim of the study: *to evaluate the effect of sleep hygiene measures and home remedies on minimizing the insomnia and restless leg syndrome.*
Subjects and Methods: Design; *A quasi - experimental (pre/post-test) research design was utilized.*
Setting: *The study was carried out in the hemodialysis unit at Assiut University Hospitals.*
Sample: *The total number of the hemodialysis patients was (356 patients) the assessment conducted on about 50% (180 patients) while sleep hygiene measures and home remedies applied on (90 patients). A purposive sampling technique was utilized.*
Tools: *four tools have been utilized****;***
Tool I: *an interview questionnaire sheet to collect patients' demographic characteristics.*
Tool II: *Insomnia Severity Index.*
Tool III: *Restless Leg Syndrome Screening Questionnaire and*
Tool IV: *sleep hygiene measures and home remedies nursing instructions****.***
Results*: Nearly one-third of the studied sample their age ranged between 50 - 65 years old, with a mean of (44.21±11.21) years. The prevalence of insomnia and restless legs syndrome were 42.8 % & 51.7 respectively. The statistical significant difference was found between pre and post application of sleep hygiene measures and home remedies nursing instructions as regards the severity of both insomnia and restless leg syndrome.*
Conclusion: *Giving written sleep hygiene measures and home remedies nursing instructions for patients have an obvious effect in reducing the prevalence and severity of insomnia and restless legs syndrome.*
Recommendations: *Booklet and pamphlets with an Arabic language must be provided for each hemodialysis patient to help them manageing their insomnia and restless leg syndrome.*

Keywords: *Incidence, Insomnia, Home Remedies, Hemodialysis, Sleep Hygiene Measures, and Restless Leg Syndrome*

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I. Introduction

Restless legs syndrome (RLS) is described as a disorder in sensorimotor systems characterized by an unpleasant sensation in the legs like throbbing, pulling, creeping and an uncontrolled willingness to move the legs and are considered as remarkable signs and symptoms of the disorder. They are more prominent at night when a person is relaxing or at rest and, consequently, the patients' desire to move their legs (**Perl et al., 2006).** This is may be due to an uncomfortable feeling when they are motionless. It might be a genetic disorder or secondary to iron deficiency, neurodegenerations, being pregnant, some medications and severe kidney diseases **(Niloufar et al., 2017).** These symptoms commonly appear at night or at rest times, leading to sleep disturbances **(Aritake-Okada et al., 2011, Chavoshi al., 2015)** that relieved when the patient move his legs **(Kim et al., 2008).**

The prevalence of RLS in the general population extensively varies notably depending upon the population surveyed, for example, it is reported that the prevalence of RLS in Europe and North America is five to twenty percent and in Asia less than four percent **(Garcia-Borreguero et al., 2006).** It's also stated that RLS can be associated with multiplied morbidity and mortality between End Stage Renal Disease (ESRD) patients **(Molnar et al., 2007**). Certainly, the importance of diagnosing the RLS and

its treatment are ignored issues in dialysis centers **(Seyed et al., 2015).** The survey conducted by (**Ibrahim & Wegdan 2011)** on 264 patients revealed that the presence of insomnia was 57.6% and RLS was 56.4%. Also, **(Ezzat & Mohab, 2015)** conducted study in Ain Shams University, Cairo, Egypt and found that "The percentage of insomnia and RLS were (69.0% and 18.0%) respectively.

Lifestyle modification and home remedies can help to relieve signs and symptoms of RLS as soaking in a warm bath and massaging the legs to relax the muscles, applying warm or cool packs or alternating use of the two, may lessen the limb sensations, Establishing good sleep hygiene measures , Getting moderate and regular exercise can also relieve signs of RLS, however, overdoing it or working out too late in the day may additionally accentuate signs and symptoms *(Mayo Foundation for Medical Education and Research (MFMER), 2018).*

Insomnia is known as a sleep disorder where the affected person exhibits it hard to fall and/or stay asleep. Patients complained from insomnia have one or more of the subsequent signs and symptoms: difficulty falling asleep, waking up frequently throughout the night and having a problem returning again to sleep, waking up too early within the morning, and feeling tired upon waking **(National Sleep Foundation, 2017).** Also, insomnia may additionally cause personal distress and unfavorable social and economic outcomes, leading to a number of harmful effects on behavior, health, sense of well-being, entertainment of interpersonal relationships and personal safety (**Khan**, **2011).**

Sleep hygiene is an expansion of different practices and habits which might be necessary to have precise nighttime sleep quality and full daytime alertness **(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)**. Sleep hygiene is effective approaches for dealing with different kinds of sleep problems, in particular, insomnia **(Green, 2017).**

(Green, 2017) reported that there are twenty healthful sleep behavior assist the patient to sleep better consisting of; get up at the same time every day, decide that sleep is a vital part of the day, Avoid staying at bed if you can't fall asleep, have a routine relaxing bedtime, calm in mind with relaxation techniques, Prepare the bedroom for comfort sleeping, Only use the bedroom for sleep and intimacy, Avoid using electronic phones, laptops or any other electronics immediately before sleeping, choose the right mattress, choose high quality bedding and pillows, keep noise away from the bedroom, avoid caffeine and energy drinks, cut out the night-cap, stay hydrated, food should be avoided as (sugary meals before sleeping, especially chocolate as it contains caffeine, spicy food and food containing garlic & pasta) , food must be eaten before bed (low sugar cereal, banana, handful of nuts, & low-fat yogurt), regular exercise, get some sun, quit smoking& avoid sleeping tablets and take a look at the medication's side-effects.

Nurses have an invaluable role in recognizing undetected RLS, in reassuring and educating patients and their families about the condition, and checking that it is not secondary to other conditions. With their skills in listening to patients and liaising with their medical colleagues, they can help to alleviate the symptoms of RLS, improving patients' daytime functioning and enhance good night sleeping.

Significance of the study:

Restless leg syndrome (RLS) is a distressing sleep problem that is typically experienced by patients performing maintenance hemodialysis which cause patients to complain from insomnia (**Yazdi et al., 2015**). Approximately, 20% - 30% of patients with hemodialysis experience RLS while the prevalence of RLS is 2% - 15% in the general population. Patients with RLS usually experience several complications including problems with doing daily tasks and sleep deprivation, excessive daytime sleepiness, chronic insomnia, daytime drowsiness, fatigue during the day, stress, anxiety, depression, driving problems, and disruption of the social activities and family life, which can impair the quality of life **(Chatterjee et al., 2015 and Yeh et al., 2016**). Moreover, RLS may cause problems with the dialysis process **(Cirillo & Wallace 2012).** From the researchers' clinical experience, it has been observed that the patients who performed hemodialysis need special educational nursing instructions about sleep hygiene measures and home remedies to improve the patients' sleep and help to decrease the severity of Restless leg syndrome.

Aim of the study:

To evaluate the effect of sleep hygiene measures and home remedies on minimizing the insomnia and restless leg syndrome among hemodialysis patients.

Research hypotheses:

Patients will experience an improvement in their sleep and decrease the severity of Restless leg syndrome after applying the sleep hygiene measures and home remedies than before.

II. Subjects and Methods

2.1 Research design:
A quasi-experimental (pre/post-test) research design utilized to carry out this study.
2.2 Setting:
The study was carried out in hemodialysis unit at Assiut University Hospitals.
2.3 Study Sample:
Purposive sample technique was used in this study. **According to Assuit University Hospital records, 2017;** the total number of hemodialysis patients at the unit was 356**.** The study sample was composed of 180 patients; fifty percent of them (90 patients) were randomly chosen to implement sleep hygiene measures and home remedies.
Exclusion criteria included:
1. Kidney transplanted patients.
2. Amputated foot patients.
3. Currently being treated for RLS
4. Patients take medications such as Selective serotonin reuptake inhibitors (SSRIs) complaining from Akathisia of the restless leg syndrome.

2.4 Tools of the study:
Four tools have been utilized in this study and designed by the researchers to gather the necessary data for this study.

Tool (1): An interview questionnaire sheet for the patient: It was developed by the researchers to collect demographic data & medical data; it includes age, gender, educational level, marital status, dialysis duration, dialysis sessions number per week, time of each session, and the chronic diseases.

Tool (2): The Insomnia Severity Index (pre/post 4 weeks): This instrument was validated and used by **(Heidari & colleagues, 2012).** It included seven questions related to insomnia. This questionnaire gives a zero to twenty- eight scores, and a higher score means more severe insomnia.

Scoring system:
Total score categories as:
Zero to seven = No clinically significant insomnia
Eight to fourteen = Sub threshold insomnia
Fifteen to twenty-one = Clinical insomnia (moderate severity)
Twenty-two to twenty-eight = Clinical insomnia (severe)

Tool (3): Restless Leg Syndrome Screening Questionnaire (Patient Self-Report Version) (pre/post 4 weeks): This questionnaire has been accomplished and utilized by **(Dehghan & colleagues, 2012).**
This tool contains seven questions that assess the main symptoms of the problem. This questionnaire gives a zero to ten score, the positive syndrome is confirmed when the score greater than seven. International Study Group Diagnostic Criteria for restless leg syndrome are arranged **as follows:**
1. The motive to move the legs, in accordance with an uncomfortable and unpleasant feeling in the legs.
2. The impulse to move the legs or unpleasant sensations, which start or become worse during periods of rest or inactivity such as lying or sitting.
3. The motive to move the legs or unpleasant sensations that go away partially or completely, at least for the duration of a continuous activity of moving such as walking or stretching.
4. The impulse to move the legs or unpleasant sensations, which become worse in the evening and at night than during the day, or only occur in the evening and night time.

Tool (4): Sleep Hygiene Measures and Home Remedies nursing instructions:
It's been designed in a simple Arabic language by the researchers according to their clinical experience, the related literature overview and critiques of the clinical and nursing expertise. Written materials have been prepared for use as nursing educational instructions; knowledge about sleep hygiene measures and advices about foods and fluids that must be taken before sleep. Additionally, Instructions about how to manage restless leg syndrome at the home (home remedies).

2.5 Validity and reliability of the tools:

For validity assurance purpose, the tools were submitted to a panel of five experts in Medical-Surgical Nursing, Community Health Nursing, and Internal Medicine who reviewed the tools for clarity, relevance, comprehensiveness, understanding, and applicability, minor modifications had been done. The content validity of this tool becomes checked by professional professors in the fields of medicine and nursing and correction completed accordingly.

Reliability of the tools (Tool II and Tool III) was performed and calculated statistically. The Cronbach's values were measured for tool II (The Insomnia Severity Index) was (A = 0.982), As well tool III (Restless Leg Syndrome Screening Questionnaire) was (A=0.856).

2.6 A pilot study: The pilot study executed on ten percent of participants to test the study tools for clarity, applicability and time consumed. The pilot study excluded from the study subject.

2.7 Ethical Consideration:

- Research proposal was approved from the ethical committee in the Faculty of Nursing, Assiut University.
- There was no risk for the study patients during the application of the research.
- The study followed common ethical principles in the research.
- Oral consent was obtained from patients who were willing to participate in the study after explaining the nature and purpose of the study.
- Confidentiality and anonymity was assured.
- Study patients had the right to refuse to participate or withdraw from the study without any rational at any time.
- Study patients' privacy was considered during collection of the data.

2.8 Data collection: Official permissions from the head of the hemodialysis unit at Assiut University Hospitals to carry out the study. Oral consent has been obtained from the patients who were involved in the application of the study.

2.9 Procedure:

The study has been accomplished in four phases:

I- Assessment Phase: The researchers developed the nursing instructions to improve patients' ability to manage insomnia and restless leg syndrome, and the educational materials were prepared.

II-Planning phase: This phase included the arrangement for conduction of the education sessions such as: teaching place, sessions, audiovisual aids, and handout.

Teaching place: the program was conducted in the hemodialysis unit at Assiut University Hospitals.

Teaching Time: The time of the program decided according to the shift which hemodialysis patients involved in.

Teaching methods and materials: The researchers used simple teaching methods such as: lecture, discussion, the media as photos and handouts prepared by the researchers and distributed to every patient at the end of the education session.

Sessions:

The nursing instructions have been implemented for the studied sample in term of sessions over two days. The nursing instructions had been developed by the researchers based on the review of relevant literature and available resources. There had been a total of two sessions were conducted for every affected person, each session ranged from (fifteen to twenty) minutes. After every session, there have been ten minutes before giving feedback. Each affected person obtains a copy of the educational nursing instructions. The researchers used photos for illustration and diagram to educate the affected person.

- **The first session:** Was started during first one hour after beginning the dialysis for the patient's hemodynamic stability, it includes instructions about how to manage insomnia and help to sleep better, and advices about foods and fluids must be taken before the patient goes to bed that help to sleep. Instruct the patient about twenty healthy sleep habits which help the patient to sleep better it contains two parts:

Part 1: Instruct the patient about general healthy sleep habits such as; get up at the same time every day, avoid staying in bed if you can't fall asleep, have a relaxing bedtime routine, calm in mind with relaxation techniques, prepare the bedroom for comfort sleeping, Only use the bedroom for sleep and intimacy, avoid using electronic gadgets before sleeping, choose the right mattress, choose high quality bedding and pillows, and don't allow noise to keep awake.

Part 2: Instruct the patient about food and fluids must be taken and foods or fluids should be avoided before sleeping as; stay hydrated; better sleep is thought to be associated with drinking enough water during the day. Food must be eaten before bed as (low sugar cereal, banana, handful of nuts, & low-fat yogurt), regular exercise, get some sun, quit smoking, & avoid sleeping tablets and revise the medication's side-effects. Avoid caffeine and energy drinks as (Coffee, black tea, green tea, cola, Pepsi, soft and sports drinks, and sugary drinks). Cut out the night-cap (avoid drinking alcohol), Food to avoid (sugary meals before bed, in particular, chocolate as it contains caffeine, spicy food and food containing garlic & pasta),

The second session: was started in the second session ; instruct the patient about ten home remedies for restless legs syndrome; (1) Gently massage the legs with a small amount of apple cider vinegar before sleeping each night, (2) To reduce leg muscles cramping and pain, use warm and cold soaks, (3) Drink half a cup of the solution of blackstrap molasses thirty minutes before sleeping, (4) Epsom salt bath before sleeping can help sleep properly and enables soothe sore muscles and calm the nerves, (5) Drink one-fourth cup of tonic water before sleeping each night, it acts as a muscle relaxant and improves blood flow to the muscles. (6) Use camphor cream which helps relieve inflammation and alleviate RLS signs and symptoms. (7) Slightly warm some coconut oil after which rubs it everywhere in the legs. (8) Massage legs with chamomile oil for a couple of minutes before sleeping. (9) Apply peppermint oil directly on the legs and then gently massage legs for five to ten minutes. (10) Simply rub a few drops of lavender oil on the bottom of every foot earlier than drowsing every night time.

III- Implementation phase: The educational nursing instructions was conducted in six months; every patient take two sessions for two days to complete the nursing instructions content.

IV-Evaluation phase:

The patients were evaluated for reducing in the severity of insomnia and improving restless legs syndrome symptoms (after one month) by the researcher after nursing instructions implementation by using the second and third tools.

2.10 Field work

In the first session, the researchers introduced themselves to patients and explain the purpose of the study. Pretest was done before the implementation of the sleep hygiene measures and home remedies nursing instructions, each session started by a summary about what was given during the previous session and the objectives of the new topics. Finally the post test was done to evaluate the effect of nursing instructions. This study conducted during the period of 6 months starting from January 2018 until the end of June 2018. Patients were taking during morning and afternoon shift, two patients in every shift and four patients per week.

2.11 Statistical analysis:

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by **number and percent** (N, %), where continuous variables described by mean and standard deviation **(Mean, SD)**. **Chi-square test** and Fisher exact test used to compare between categorical variables where compare between continuous variables by **t-test** \and **ANOVA TEST**. **A two-tailed p < 0.05** was considered statistically significant. We are used person Correlation to Appear the Association between scores. All analyses were performed with the **IBM SPSS 20.0** software.

III. Results

Table (1): Distribution of demographic characteristics for the studied patients (n=180):

Variable	**N. 180**	**%**
Age:		
- 18- < 30	25	13.9
- 30- < 40	47	26.1
- 40- < 50	50	27.8
- 50 and above	58	32.2
Mean ± SD(range)	44.21±11.21 (18-65)	
Gender:		
- Male	117	65.0
- Female	63	35.0
Marital status:		
- Single	33	18.3
- Married	143	79.4
- Divorced	1	0.6
- Widowed	3	1.7
Education Level:		
- Illiterate	81	45.0

- Read and write	9	5.0
- Primary school	16	8.9
- Preparatory school	4	2.2
- Secondary school	53	29.4
- University	17	9.4
Occupation:		
- None working	69	38.3
- Farmer	55	30.6
- Student	9	5.0
- Professional	39	21.7
- Hospital member	3	1.7
- Retired	5	2.8

Table (1): illustrated that nearly one third of the studied patients their age ranged between 50 - 65 years old, with mean of (44.21±11.21) years, more than two third of the studied sample were males (65.0 %), while 79.4 % of them were married. Also, the table clear that more than one third of patients were illiterate 45.0 % and 38.3 % were not working.

Table (2): Distribution of studied patients regarding to their medical data (N=180):

Variable	**No**	**%**
Duration of dialysis:		
- 6 month <12 month	37	20.6
- 1 year < 3 years	26	14.4
- 3 years & more	117	65.0
Mean ±SD (range)	4.25±2.67(0.07-10.2)	
Number of dialysis session per week:		
- One	3	1.7
- Two	31	17.2
- Three	146	81.1
Time of each session:		
- 3 hours	2	1.1
- 4 hours	177	98.3
- 5 hours	1	.6
Diabetes:		
- Yes	75	41.7
- No	105	58.3
BMI:		
- Low weight < 20 Kg	12	6.7
- Standard level of weight (20 < 26 Kg)	40	22.2
- Over weight (26 < 30 Kg)	30	16.7
- Obese (30 < 40 Kg)	84	46.7
- Morbid obesity (> 40)	14	7.8
Hypertension:		
- Yes	150	83.3
- No	30	16.7

Table (2): distribution of the studied patients regarding to their medical data; it was observed that 65.0 % of the study sample performs dialysis for 3 years & more, with a mean of (4.25±2.67). Also, the table show that 81.1% & 98.3% of them respectively takes three sessions per week and the time of sessions four hours. As regard to medical history the table clears that more than one-third of the sample has diabetes and obesity, while 83.3 % of them have hypertension.

Table (3): Distribution of studied patients according to the incidence of insomnia and restless leg syndrome (N=180):

items	**prevalence**	
	N. 180	**%**
Insomnia:		
- yes	77	42.8
- No	103	57.2
Restless Leg Syndrome:		
- yes	93	51.7
- No	87	48.3

Table (3): indicated that the incidence of insomnia in the studied patients was 42.8%, while more than half of them (51.7%) were complaining from restless leg syndrome.

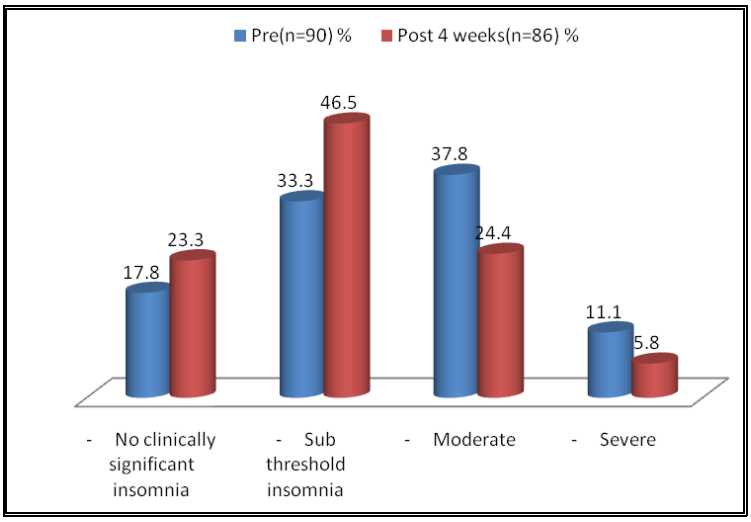

Fig. (1): Relationship between total score categories of Insomnia Severity Index Scale before and after nursing instructions

Fig (1): illustrated that there was a statistically significant difference between pre and post implementation of nursing instructions for the studied sample as regards total score categories of Insomnia Severity Index Scale.

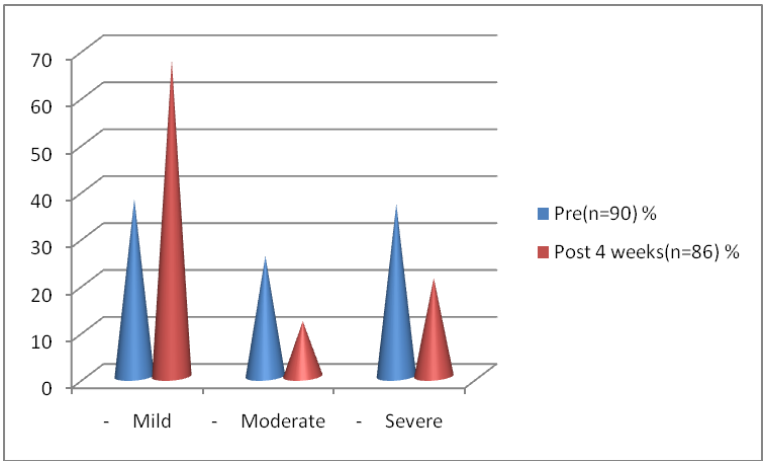

Fig (2): Relationship between total score categories of Restless Legs Syndrome Scale before and after nursing instructions

Fig (2): show that there was statistically significant difference between pre and post implementation of nursing instructions for the studied sample as regards total score categories of Restless Legs Syndrome Scale.

Table (4): Correlation coefficient between Insomnia Severity Index Scale and Restless Legs Syndrome scale:

Pre-instructions			**post instructions**		
Mean ± SD	**R**	**P**	**Mean±SD**	**R**	**P**
13.42±6.95	0.300	<0.001**	8.27±6.26	0.891	<0.001**
10.25±4.04			7.91±3.28		

**** Statistically Significant Correlation at p. value<0.01**

Table (4): clear that there was a statistically significant difference between a mean score of both Insomnia Severity Index Scale and Restless Legs Syndrome scale in pre and post implementation of nursing instructions.

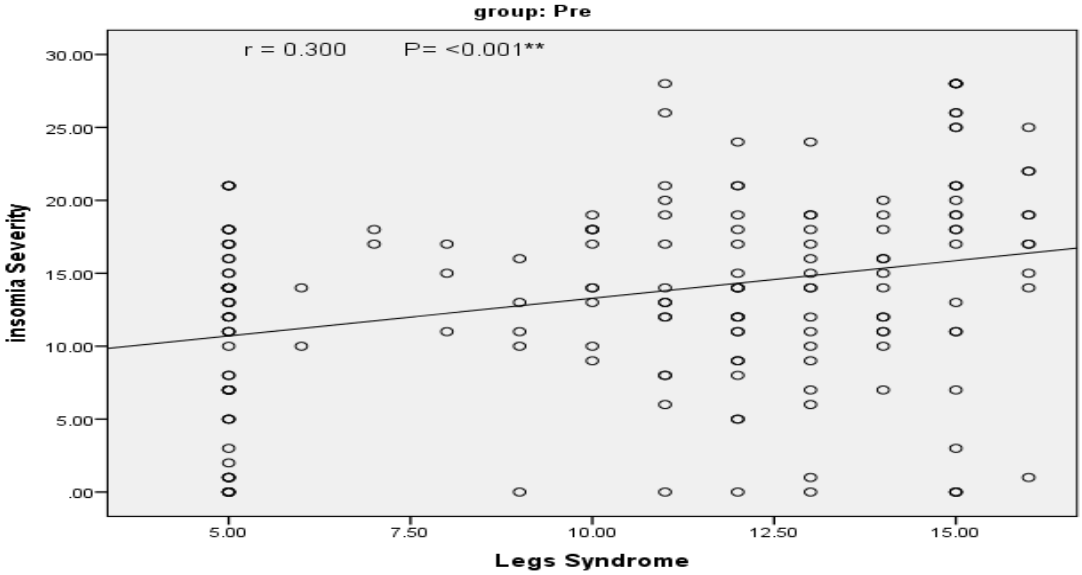

Fig (3): Correlation coefficient between Insomnia Severity Index Scale and Restless Legs Syndrome scale

Fig (3): This figure illustrated that there was a positive correlation between Insomnia Severity Index Scale and Restless Legs Syndrome scale. That means that as the severity of the restless leg syndrome decrease, insomnia severity decreased and quality of sleep increase as well.

Table (5): Relationship between Insomnia Severity and Restless Legs Syndrome according to demographic data of the studied patients

Demographic data	Insomnia Severity		Legs Syndrome	
	Pre instructions	**Post instructions**	**Pre instructions**	**Post instructions**
Age group:				
- 18- < 30	10.2±7.92	6.08±6.23	9.36±4.27	6.8±3.08
- 30- < 40	13.38±6.63	8.36±6.22	10.11±3.82	7.89±3.2
- 40- < 50	14.48±5.06	8.58±4.94	10.36±4.09	7.98±3.13
- 50 and above	13.91±7.88	8.88±7.2	10.66±4.12	8.33±3.51
P.value	**0.077**	**0.292**	**0.559**	**0.281**
Gender:				
- Male	12.31±6.79	7.22±5.88	9.6±4.09	7.37±3.02
- Female	15.48±6.83	10.22±6.52	11.46±3.7	8.9±3.51
P.value	**0.003****	**0.002****	**0.003****	**0.002****
Marital status:				
- Single	11.94±7.27	7.48±6.03	9.12±4.04	7.61±3.39
- Married	13.71±6.88	8.43±6.33	10.43±4.03	7.92±3.19
- Divorced	12±0.0	4±0.0	12±0.0	6±0.0
- Widowed	16.33±8.08	11±6.93	13.67±2.31	11±6.08
P.value	**0.0514**	**0.652**	**0.159**	**0.351**
Education Level:				
- Illiterate	13.41±7.07	8.01±6.11	10.49±3.74	7.95±3.33
- Reading & writing	12.22±5.26	5.78±3.8	7.67±1.94	6.11±2.47
- Primary school	15.13±7.33	11.06±6.78	12±4.46	8.94±3.17
- preparatory school	13.75±6.95	7.5±5.57	9.5±5.45	8.25±3.95
- Secondary school	12.09±6.23	7.32±5.63	9.68±4.3	7.32±3.07
- University	16.53±8.45	11.35±8.21	10.76±4.27	9.41±3.48
P.value	**0.255**	**0.068**	**0.132**	**0.084**
Occupation:				
- None working	14.28±6.78	9.2±6.05	11.03±4	8.43±3.43
- Farmer	11.51±6.19	6.4±4.64	9.42±3.75	6.82±2.65
- Student	11.78±7.31	7.11±6.09	11±3.64	7.44±3.09
- professional	15.13±7.17	9.46±7.6	9.72±4.27	8.54±3.54
- Hospital member	8±8.89	4.67±7.23	11±5.57	7±4.36
- Retired	15.4±10.21	11±9.57	11±5.48	9±3.16
P.value	**0.065**	**0.071**	**0.293**	**0.065**

- independent t-test * Significant difference at p. value<0.05, , ** Significant difference at p. value<0.01
- ANOVA TEST, * Significant difference at p. value<0.05, , ** Significant difference at p. value<0.01

Table (5): Relationship between Insomnia Severity and Restless Legs Syndrome according to demographic data of the studied patients; it was indicated that there was a statistically significant difference between the Insomnia Severity & Restless Legs Syndrome and gender while there wasn't statistically significant difference between the Insomnia Severity & Restless Legs Syndrome and other demographic data.

Table (6): Relationship between insomnia severity and legs syndrome according to medical data:

Medical data	Insomnia Severity		Legs Syndrome	
	Pre instructions	**Post instructions**	**Pre instructions**	**Post instructions**
Duration of dialysis				
- 6 months < 12 months	10.43±7.34	5.43±4.9	8.92±3.91	6.7±2.8
- 1 year < 3 year	13.04±6.32	7.15±5.71	9.92±3.71	7.38±3.18
- 3&more	14.44±6.73	9.42±6.46	10.74±4.08	8.4±3.35
P.value	**0.008****	**0.002****	**0.051**	**0.015***
Number of dialysis session per week				
- One	3.33±4.93	1.67±2.89	8.67±3.51	4.67±0.58
- Two	12.81±5.72	6.81±4.15	8.13±3.23	7.55±2.96
- Three	13.75±7.09	8.72±6.56	10.73±4.07	8.05±3.34
P.value	**0.031***	**0.054**	**0.004****	**0.168**
Time of each session				
- 3 hours	9±11.31	4±5.66	10.5±7.78	7.5±3.54
- 4 hours	13.5±6.93	8.35±6.27	10.23±4.02	7.93±3.29
- 5 hours	7±0.0	3±0.0	14±0.0	5±0.0
P.value	**0.433**	**0.436**	**0.648**	**0.655**
1. Diabetes:	16.96±5.45	10.78±6.5	11.52±3.72	8.87±3.31
P.value	**0.003****	**0.059**	**0.093**	**0.145**
2. Obesity:	14.43±6.79	8.29±6.17	10.38±3.57	7.62±3.34
P.value	**0.479**	**0.992**	**0.862**	**0.679**
3. Hypertension:	13.6±6.77	8.25±6.05	10.29±4.03	7.95±3.27
P.value	**0.479**	**0.915**	**0.791**	**0.761**

- Independent t-test * Significant difference at p. value<0.05, , ** Significant difference at p. value<0.01
- ANOVA TEST, * Significant difference at p. value<0.05, , ** Significant difference at p. value<0.01

Table (6): There was statistically significant difference between Insomnia Severity & Restless Legs Syndrome and medical data as regard duration of dialysis in pre and post-instruction, number of dialysis session per week in pre-instructions and diabetes in pre-instructions regarding insomnia severity.

IV. Discussion

Restless leg syndrome (RLS) is defined as a sensorimotor sickness with features of each neurologic and sleeps disturbances. Patients describe an intensely uncomfortable impulse to move legs predominantly in the evening or at night, which disturb their sleep. The pattern of movement is involuntary dorsiflexion of foot and lower leg, that lasting two to five seconds (**Chavoshi et al., 2015, Einollahi & Izadianmehr, 2014**).Sleep problem is one of the critical troubles in hemodialysis patients that could negatively influence their life quality **(Farideh et al, 2018).** Insomnia is a common treatable problem of inadequate or poor-quality sleep, negative daytime consequences **(Schenck et al, 2003)**. Insomnia affords as hassle falling asleep (long-sleep latency), trouble staying asleep (excessive or extended awakenings), or feeling nonrestored from sleep (**Carlos et al., 2003)**.

Our present study revealed that; nearly one-third of the studied sample their age ranged between fifty to sixty-five years old, with a mean of (44.21±11.21) years, more than two thirds of the studied sample was males, married, and more than one-third of patients were illiterate and not working. According to the researcher's opinion,' it was an expected result as old ages have been considered as a risk factor for developing chronic renal failure. This result becomes within the identical line with **(Niloufar et al., 2017)** who reported that "the mean age of patients was 48.99± 15.72 years. More than two-thirds of the studied samples were males, married, illiterate and none working". Also, in the same line with **(Zohreh et al., 2015)** who reported that "seventy – two percent of the study samples were male; the majority of the sample had been married". In contrast to our study findings; **(Khan et al., 2011)** who revealed that "higher prevalence of insomnia was detected in patients of twenty-six to forty-five years old and the majority of the sample was males", Also; **(Sabbatini et al., 2002)** discovered that "a higher prevalence of insomnia in females and older patients".

Regarding to the period from starting the dialysis; more than half of the studied sample ranging their duration of dialysis from 3 years & more, with mean of (4.25±2.67) years, This study finding comes in disagreement with **(Niloufar et al., 2017)** which found that the mean duration of dialysis was (3.99 ± 3.37) years.

Regarding to medical data assessment; the present study revealed that more than one-third of the studied sample have diabetes and obesity; the majority of the sample has hypertension. This results supported by (**Niloufar et al., 2017)** who found that the commonest etiology of chronic kidney disease was hypertension and diabetes. In addition, **(Khan et al., 2011)** reported that the causes of end stage renal disease (ESRD) were uncontrolled hypertension and diabetes mellitus.

The current study found that more than two fifths of the studied sample complains from insomnia. This results supported by **(Khan et al., 2011)** who reported that more than two fifths of sample complaining from insomnia in hemodialysis patients.

Regarding to Insomnia Severity Index Scale; the present study revealed that there was a statistically significant difference between pre and post implementation of educational nursing instructions which includes sleep hygiene measures for the studied sample as regards minimizing insomnia and improving in the quality of sleep after the intervention. This results supported by (**Farideh et al., 2018)** who revealed that "there was a statistically significant relationship between the sleep quality before and after the intervention. In other words, foot massage became powerful for the sleep high-quality improvements. This research showed that nightly short-time foot message might be beneficial for sleep problems and remedy a few issues inclusive of sleep problem and short nightly sleep duration". This improvement may be due to patients were interested with the given topic and recognized the importance of sleep hygiene measures and home remedies in minimizing insomnia severity and relieve symptoms regarding to RLS. This indicated the effectiveness of the nursing instruction.

The prevailing study assessed the prevalence and severity of restless legs syndrome and clarified that the prevalence of RLS was (51.7 %). more than one-third of the sample have a mild and severe degree of RLS, more than one-quarter of the studied sample had complained from a moderate degree of RLS. (**Niloufar et al., 2017)** mentioned that "out of two hundred sixty hemodialysis patients (fifty-five percent) presented with RLS". According to **(Chavoshi et al**., **2015**) who reported that "the prevalence of RLS was 31.7% in hemodialysis patients in Tehran, Iran". Also; (**Al-Jahdali et al., 2009)** evaluated 227 ESRD patients in Jeddah, Saudi Arabia and reported that "The prevalence of RLS was 50.22%". Similar studies in other countries reported that the prevalence of RLS to be six percent to eighty percent in patients with chronic renal failure reported by **(Allen & Earley, 2001)**, 14% in Canada (**Mucsi et al., 2005**), 18.4-21.5% in Italy (**Merlino et al., 2006**), 6.6% in India (**Novak et al., 2006**), 20.3% in Syria **(Salman, 2011),** 62% in China (**Hui et al., 2000),** and twelve to twenty three percent in Japan (**Kawauchi et al., 2006**). These highly variable results may be due to the difference in races, diagnostic criteria of RLS, methods of studies. Our results were in line with Saudi Arabia and China studies. Also, this result is in line with **(Niloufar et al., 2017)** who reported that more than half of the sample in hemodialysis patients complained from RLS.

Current study reported that there was a statistically significant difference between pre and post implementation of educational nursing instructions for the studied sample regarding Restless Legs Syndrome. This results supported by **(Giannaki et al., 2010)** who reported that "exercise intervention, even at low intensity, may be taken into consideration a safe non-pharmacological method for the amelioration of RLS motor signs and symptoms in the course of hemodialysis. Long-term exercise could be used as monotherapy in patients with RLS with low-severity symptoms". According to **(Russel, 2007)** who achieved a case study to analyze the outcomes of massage therapy on a thirty-five years old married female who experienced the stressed legs syndrome for twenty-three years. Forty - five mins massages become completed for three weeks lying within the abdomen and on the back. The results of massage on the range of hours of sleep, waking up often, signs and severity of restless legs syndrome were measured and it becomes found that message is gradually improved the sleep quality and affected person feel more comfortable and can higher perform duties relating to each day activities. Also, massage can increase blood supply to the calf muscle, promote circulation and improve the venous return; all these effects can decrease the sensation of restless leg syndrome.

Based on the obtained results there was a positive correlation between Insomnia Severity Index Scale and Restless Legs Syndrome scale which mean that as the severity of restless leg syndrome decrease the insomnia severity index decreased and the quality of sleep increase as well. This study finding comes in agreement with (**Riesman, et al, 2004, & Mucsi, et al, 2005)** who mentioned that the patients who suffer from Restless Legs Syndrome disorders often exhibit poorer quality of life, lower sleep quality, and higher prevalence of insomnia, when compared with hemodialysis patients with no RLS symptoms.

Additionally, there was a statistically significant distinction among Insomnia Severity and Restless Legs Syndrome as regards the number of dialysis session per week in pre-instructions and diabetes in pre-instructions regarding insomnia severity. The study results are similar to results of **(Niloufar et al., 2017)** who illustrated that longer dialysis duration was associated with higher prevalence of RLS. According to **(Al-Jahdali et al., 2009)** who revealed that diabetes mellitus is a dependent risk factor of RLS. Also (**Anwar et al., 2011)** found that there was an obvious relation between hypertension and RLS.

V. Conclusion

There has been a statistically significant distinction between pre and post implementation of educational nursing instructions for the studied sample as regards minimizing insomnia, improve in sleep after implementing the nursing instructions. Regarding the severity of restless legs syndrome; more than one-third of the studied sample have a mild and severe degree while less than one-third of the them complained from a moderate degree. As regards Restless Legs Syndrome there was a statistically significant distinction among pre and post implementation of educational nursing instructions. Also; giving written nursing instructions for patients was more effective in decreasing insomnia and restless legs syndrome for patients.

VI. Recommendations

- Booklet and pamphlets must be adequate and available for every hemodialysis patients with Arabic language.
- Permanent attendance of a specialized nurse in the dialysis unit is of great importance to instruct and apply the educational instructions to the patients, Providing a written instruction in a form of booklet, brushers, or pamphlets has great value in reminding patients of the nursing instructions.
- Further research related to the current study on larger probability samples to achieve generalizability and wider utilization of the designed protocol.

Limitation of the study:

Four patients died during implementation stage so they excluded from the study.

VII. References

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