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## The Effect of Benson's Relaxation Technique on Anxiety, Depression and Sleep Quality of Elderly Patients Undergoing Hemodialysis

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**Abstract: Background:** Chronic kidney disease (CKD) is the most important cause of morbidity and mortality among elderly. Hemodialysis is the most commonly applied method for treatment, and is accompanied by a high incidence of psychological problems such as anxiety, depression, and sleep disturbance, which are having a negative impact on one's life. Benson's relaxation technique (BRT) is an effective technique used to reduce stress, anxiety, depression, and enhance sleep quality in elderly patients undergoing hemodialysis. **Aim:** determine the effect of Benson's relaxation technique on anxiety, depression, and sleep quality among elderly patients undergoing hemodialysis. **Design:** Quasi- experimental, pre and post intervention design was used. **Setting:** The study was carried out in the hemodialysis unit affiliated to Mansoura University Hospital, Mansoura, Egypt. **Subjects:** A purposive convenience sample of 92 elderly patients scheduled for maintenance hemodialysis. **Tools:** Five tools were used: interview schedule-mini-mental state examination (MMSE) - study subject's relaxation technique knowledge-hospital anxiety and depression scale (HADS) and Pittsburgh sleep quality index (PSQI). **Results:** The age of the studied subjects ranged from 60 to 92 years with mean  $\pm$  SD = 66.256 $\pm$  6.78 years, 70.9% are males, all mean total scores of hospital anxiety scale, depression scale, and Pittsburgh sleep quality index for elderly patients improved significantly after applying Benson's relaxation technique. **Conclusion:** Benson's relaxation technique (BRT) is an effective technique to reduces level of anxiety, depression, and improve sleep quality in elderly patients undergoing hemodialysis. **Recommendation:** Hospitals are recommended to use the Benson's relaxation technique for the management of anxiety, depression and sleep disturbance associated with hemodialysis for elderly patients.

**Keywords:** Elderly, Hemodialysis, Benson's Relaxation Technique, Depression, Anxiety, Sleep quality.

### INTRODUCTION

Aging population is a worldwide phenomenon so the number of elderly people is growing faster than any other age group, as a result of both longer life expectancy and declining fertility rates <sup>(1)</sup>. Currently, life expectancy of Egyptian males and females at birth is 70.82 years and 76.2 years, respectively <sup>(2)</sup>. Moreover, aging is a fundamental risk factor for the development of many chronic disease especially kidney disease, which is considered a complex disease with an increasing incidence in the elderly people <sup>(3)</sup>.

Chronic kidney disease (CKD) is a progressive, irreversible reduction in renal function <sup>(4)</sup>. It is recognized as one of the most important cause of morbidity and mortality <sup>(5)</sup>. The incidence of this condition is increasing, worldwide, and the number of individuals diagnosed with it doubles every seven years <sup>(4)</sup>. It is likely to increase further as a consequence of aging populations and a complication to type II diabetes mellitus. The median prevalence of chronic kidney disease (CKD) in the elderly population in Europe, America, Asia, and Australia varies between 23.4% to 35.8 % <sup>(5)</sup>.

Common treatment methods for CKD include renal replacement therapy, hemodialysis, peritoneal dialysis and kidney transplant; among which hemodialysis is the most commonly applied method, with major impacts on patient health <sup>(6)</sup>. Depression prevalence in patients with advanced renal failure is estimated to be 20-70% <sup>(6)</sup>. Anxiety and depression are the most common and important mental

disorders among hemodialysis patients, with adverse effects on the course of disease and treatment process and are recognized as an independent risk factor for mortality in elderly patients <sup>(7)</sup>.

The incidence of sleep disturbance in the patients on maintenance hemodialysis (HD) ranges from 40 to 85%. It is one of the most physiological problems associated with hemodialysis. Previous studies reported that most patients with chronic renal failure are poor sleepers as a result of increase toxins concentrations of plasma (creatinine and urea), anemia, nocturnal hypoxia, and co-morbidities <sup>(8, 9)</sup>. Moreover anxiety, worry, sadness, and depression are among the major factors significantly associated with sleep disturbance in the elderly patients with end stage renal disease. Poor sleep in these patients has a negative impact on the physical and mental components of one's life and leads to a decrease in their performance as well as cognitive and memory dysfunction <sup>(10, 11)</sup>.

Management of anxiety, depression, and sleep disturbance among hemodialysis elderly patients includes pharmacological and non-pharmacological interventions. Considering the complications associated with pharmacological treatments, the use of non-pharmacological methods seems reasonable. Common non-pharmacological interventions include biofeedback, music therapy, yoga, mind distraction techniques, relaxation, time control, lifestyle changes, cognitive restructuring and guided imagery. Relaxation is an effective nursing intervention,

which has been introduced as useful non pharmacological method<sup>(12)</sup> which decreases stress over its effect on mental, physical conditions, depression, anxiety, self-esteem, enhance sleep and improves the quality of life of hemodialysis patients<sup>(9, 13, 14)</sup>. It acts by balancing the posterior and anterior hypothalamic regions, dropping the activities of sympathetic nervous system and inducing catecholamine secretion leads to reduced muscle tension, alleviation of adverse physiological effects, reduced blood pressure and regular breathing, pulse rate and muscle spasms induced by stress<sup>(15, 16)</sup>. There are many types of relaxation technique. Benson's relaxation technique (BRT) is one of these techniques which is better tolerated by hemodialysis patients. This technique was identified by Benson (1975)<sup>(17)</sup>. It is the most effective and easy nursing intervention method to use. It includes mindfulness techniques that are affected on wide range of physical and psychological signs and symptoms such as anxiety, pain, depression, mood and self-esteem, reduced stress and enhance sleep quality in elderly patients on hemodialysis through its effect of complete relaxation of all the muscles<sup>(9, 15, 18, 19)</sup>. Thus, the necessity of application of Benson's relaxation technique according to elderly patients' condition seems to be necessary to reduce their level of anxiety, depression, improve their quality of sleep and overall sense of wellbeing.

**Aim of the study:** To determine the effect of Benson's relaxation technique on anxiety, depression, and sleep quality among elderly patients undergoing hemodialysis.

#### **Research hypothesis:**

Hemodialysis elderly patients who apply Benson's relaxation technique (BRT) will report low anxiety, depression, and better quality of sleep.

## **SUBJECTS AND METHOD**

**Design:** Quasi- experimental, pre and post intervention research design was used in this study.

**Setting:** This study was conducted in the hemodialysis unit affiliated to Mansoura University Hospital, Mansoura Egypt.

## **SUBJECTS**

A convenience sample of 92 elderly patients who scheduled for maintenance hemodialysis in the above mentioned setting, and fulfilling the following criteria:

- Aged 60 years and above, of both sexes.
- Able to communicate effectively.
- Undergoing hemodialysis for at least six months, and scheduled for maintenance hemodialysis 2 or 3 times per week.
- Elderly people with normal cognitive ability (score of 24-30), and free from severe physical disabilities (e.g. paralysis, coma).
- Accept to participate in the study.
- Patients with kidney transplant or peritoneal dialysis were excluded.

## **TOOLS:**

### **Tool I: Mini – Mental State Examination (MMSE):**

This scale was designed by Folstien 1975 (Folstien, 1999)<sup>(20)</sup>. It was translated into Arabic language by Elokli, 2008<sup>(21)</sup>, validated and tested for its reliability ( $r = 0.93$ ) by (Abd El Moniem, 2012)<sup>(22)</sup>. It was designed for assessing the elder's cognitive function. It includes 11 items that examine the memory, orientation to time and place, attention, calculation naming, repetition, registration, language, praxis and copying of a design. This was used to exclude elders with moderate and severe degree of cognitive impairment. The MMSE scale score is 30 points and classified as follows:

- Score of 24-30 indicates normal cognitive function.
- Score of 18-23 indicates mild cognitive impairment.
- Score of 0-17 indicates severe cognitive impairment

**Tool II: Socio demographic and Clinical Data Structured Interview Schedule:** as age, sex, income, religion, educational level, marital status, presence of chronic illness as diabetes mellitus, hypertension, duration of disease and family history, habits of sleep, factor that interfere with sleep (factors related to haemodialysis session, factors unrelated to haemodialysis session).

**Tool III: Study Subject's Relaxation technique Knowledge:** It was developed by the researcher after reviewing of current literature to assess patients' knowledge about Benson's relaxation technique<sup>(9, 15, 17)</sup>. It included a set of questions about the following:

- Definition of Benson's relaxation technique
- Benefits of Benson's technique and its effect on, anxiety, depression, and sleep quality.
- Benson's relaxation technique instructions

**Scoring system of patients' knowledge about Benson's relaxation technique was done as follows,** each question had a group of answer points, each correct answer take a score of one grade, while no answer or did not know take a score of zero. The scores obtained for each set of questions was summed up to get the total score for patient's knowledge. The total score was computed out of 28.

### **Tool IV: Hospital anxiety and depression scale: (HADS)**

It was developed by Zigmond and Snaith (1983)<sup>(23)</sup>. It is a self-report questionnaire commonly used to assess levels of anxiety and depression. This scale was translated into Arabic and tested for its validity and reliability by Abd Elhameed, 2010<sup>(24)</sup>. The Arabic version was used in the present study. The reliability of this tool was tested using test retest reliability Spearman's correlation coefficient  $r = 0.861$ . The scale comprises statements which the patient rates based on their experience over the past week. It consists of 7 questions relating to anxiety are marked "A", and 7 questions relating to depression and marked "D". Patients are asked to choose one response from the four given for each item. Scores ranged from 0 to 3 and the total score is 21 is divided into four ranges: normal (0-7), mild (8-10), moderate (11-15), and severe (16-21).

### **Tool V: The Pittsburgh Sleep Quality Index (PSQI):**

This scale was developed by Buysse, et al, 1989<sup>(25)</sup>. It is an effective instrument used to measure the quality and patterns of sleep in the older adult. It was translated into Arabic

language and approved to be valid and reliable by (Asaad and Kahla, 2009) <sup>(26)</sup>. It differentiates “poor” from “good” sleep by measuring seven domains: subjective sleep quality, sleep latency (i.e., how long it takes to fall asleep), sleep duration, habitual sleep efficiency (i.e., the percentage of time in bed that one is asleep), sleep disturbances, use of sleeping medication, and daytime dysfunction. In scoring the PSQI, seven component scores are derived, each score ranged from 0 (no difficulty) to 3 (severe difficulty). The component scores are summed to produce a global score (range 0 to 21), lower scores denote a healthier sleep quality while higher scores indicate worse sleep quality.

## METHOD

1. An official letter was issued from the responsible authorities of faculty of nursing Mansoura University.
2. The head of hemodialysis unit in Mansoura university hospital were informed by the researcher about the purpose of the study and the time of data collection in order to obtain approval to carry out the study
3. The study tool II (socio demographic and clinical data structured interview schedule), and tool III (study subject's relaxation technique knowledge) were developed by the researchers after thorough review of current literature.
4. The Arabic version of tool IV, and V (Hospital anxiety and depression scale, and The Pittsburgh Sleep Quality Index (PSQI) was used by the researchers. The reliability was assured by means of r coefficient (r= 0.86, and 0.85 respectively).
5. All study tools II, III, and IV, V were tested for its content validity by 7 experts in the related fields of gerontological nursing, medical–surgical nursing, psychiatric and mental health nursing, and geriatric medicine. The necessary modifications were done consequently.
6. A pilot study carried out on 10 of elderly patients undergoing hemodialysis from specialized medical hospital, Mansoura University. These patients were excluded from the study sample.
7. The studied elderly patient was interviewed individually by the researchers to collect the necessary data using study tools, give simple information about the definition, benefits, of the technique and then apply the relaxation technique, three times per week ( Sunday, Tuesday, and Thursday), for a period of two months.
8. The researchers applied a Benson's relaxation technique after reviewing of the related literature <sup>(9, 27, 28)</sup>.
9. The patients and their care givers take information about the benefits of technique and learned about the relaxation technique through colored booklet, demonstration and re demonstration, and asked care giver to observe and guide patients to practice correctly twice a day in morning and evening for 20 min, for two months in their homes.
10. During session the researcher ask the patient to perform Benson's relaxation technique in front of him to ensure that the patient done it correctly.
11. The instruction of the Benson’s relaxation technique included the following steps:
  - Sit in a comfortable position
  - Close the eyes.

- Relax all muscles beginning from the soles for the feet to the top of the head moving forward up, and relax all parts of the body.
  - Take a breath from the nose. Exhale from the mouth whenever exhaling, repeat one word or number (as God), inhale, and exhale with comfort and confidence.
  - Do this for 20 minutes. Try to keep the body and muscles relaxed, and repeat the desired word in their mind. Then open the eyes slowly and do not move for few minutes.
12. Evaluation of the technique was done after two months using study tools (study subject's relaxation technique knowledge, hospital anxiety and depression scale, the Pittsburgh sleep quality index).
  13. The study was conducted over a period of 7 months beginning at June 2018 till the end of December 2018.
  14. Six elderly patients were excluded from data analysis because four of them not compliant with dialysis and two elderly were died.

## ETHICAL CONSIDERATIONS

Ethical approval was taken from Mansoura University Faculty of Nursing Ethic Committee. An official permission was obtained from the director of Mansoura university hospital. Verbal consent was obtained from elderly persons after complete explanation of the study purpose. The elderly were informed that their participation is voluntary and that they can withdraw from the study at any time. Anonymity, privacy of the study subjects and confidentiality of the data collected were assured.

## DATA ANALYSIS

Data was analyzed using SPSS (Statistical Package for Social Sciences) version 16. Qualitative variables were presented as number and percent. Quantitative variables were tested for normality distribution by Shapiro test. Non-parametric variables were presented as median (minimum-maximum) and Wilcoxon sign test were used for paired comparison. Normally distributed variables were presented as mean and standard deviation and paired t-test was used for pre-post comparison.  $P \leq 0.05$  was considered statistically significant.

## RESULTS

Table (1) shows the distribution of older adults' patients undergoing hemodialysis according to their socio-demographic characteristics. It was observed from the table that the studied subjects age ranged from 60 to 92 years with mean  $\pm$  SD =  $66.256 \pm 6.78$  years, older adults aged 60<75 constituted 88.4% of the studied subjects. Males were more prevalent in the studied subjects they constituted 70.9% of the patients, while 29.1% of them were females. The majority (66.3%) of the studied subjects were married.

Regarding the level of education and living condition, 52.3% of the patients had primary and secondary education, while 30.2% of them were illiterate and 17.4% of them were university degree. Regarding income about 70.9% of studied subjects reported had not enough income and only 29.1% of them reported had enough income and 69.8% living with their family.

**Table (1): The distribution of older adults' patients undergoing hemodialysis according to their socio-demographic characteristics**

Characters	Category	No (86)	%
Age (years)	60 <75	76	88.4
	>75	10	11.6
Range: 60.0 – 92.0 years, Mean ± SD = 66.256± 6.78 years			
Sex	Males	61	70.9
	Females	25	29.1
Marital status	Single	5	5.8
	Married	57	66.3
	Widow	24	27.9
Education	illiterate	26	30.2
	primary & Secondary	45	52.3
	University	15	17.5
Income	Not Enough	61	70.9
	Enough	25	29.1
Living condition	Family (Wife/ husbands)	60	69.8
	Siblings	22	25.6
	Alone	4	4.6

Table (2) shows the distribution of older adults' patients according the duration of dialysis, and number of session. It was found that 47.7% of the patients undergo for hemodialysis since less than 5 years and 31.4% of them since 5 to less than 10 years and 20.9% of them since 10

years and more. Most of the studied subjects undergo for dialysis three sessions per week and only 7% of them twice per week, and 88.4% of the patients reported the duration of each session lasts 4 hours, and only 9.3% of them reported the session last for three hours.

**Table (2): The distribution of older adults' patients according to the duration of dialysis and number of session**

Medical history	Items	No (86)	%
Duration of dialysis	< 5 years	41	47.7
	5 to < 10 years	27	31.4
	≥ 10 years	18	20.9
Number of session per week	Two	6	7.0
	Three	80	93.0
Duration of session	3 hours	8	9.3
	4 hours	76	88.4
	5 hours	2	2.3

Table (3) shows the effect of acquiring knowledge and application of Benson's relaxation technique, on mean score of anxiety, depression and sleep quality of the studied elderly. It appears from the table that the total mean score of knowledge increased, and the total mean scores for

hospital anxiety, depression, and Pittsburgh sleep quality index for elderly patients were decreased (improved) significantly after applying Benson's relaxation technique ( $P \leq 0.01$ ).

**Table (3): Effect of acquiring knowledge and application of Benson's relaxation technique, on mean score of anxiety, depression and sleep quality of the studied elderly**

Characters	Before the technique Mean ± SD	After the technique Mean ± SD	significance test
Median score of knowledge (min -max)	0 (0-7)	28 (20-28)	z=8.2 P= 0.001*
Mean score of hospital anxiety scale (HADS)	12.941±2.829	6.255±2.175	t=18.163 P= 0.001*
Mean score of hospital depression scale (HADS)	18.430±3.230	6.627±2.029	t=27.799 P= 0.001*
Mean score of Pittsburgh sleep quality index (PSQI)	18.395±1.374	12.267±1.676	t=26.036 P= 0.001*

Z of Mann-Whitney test

Table (4) shows the effect of the Benson's relaxation technique on mean score of sleep quality index subscales. The table demonstrated a significant difference was found before application of the technique and after application of

the technique concerning the mean score of the global PSQI, and its subscales (subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disturbance, use of sleep medication, and daytime dysfunction).

**Table (4): The effect of the Benson's relaxation technique on mean score of sleep quality index subscales**

PSQI subscales	Before the technique Mean ± SD	After the technique Mean ± SD	Paired t-test & P-value
Subjective sleep quality	2.613±0.489	1.093±0.292	t= 22.517 P= 0.001*
Sleep latency	2.709±0.456	1.546±0.500	t= 18.882 P= 0.001*
Sleep duration	2.883±0.322	1.965±0.416	t= 15.277 P= 0.001*
Sleep efficiency	2.965±0.184	1.941±0.386	t= 20.648 P= 0.001*
Sleep disturbance	2.965±0.184	1.907±0.475	t= 19.880 P= 0.001*
Use of sleep medication	1.255±0.799	0.988±0.711	t= 5.267 P= 0.001*
Daytime dysfunction	3.000±0.000	2.825±0.439	t= 3.684 P= 0.001*

Table (5) shows the relation between socio demographic characteristics, and the mean score of anxiety, depression, and quality of sleep after implementation of Benson's technique. The table revealed that, there are a significant

relationship between socio demographic characteristic of the studied elders, and the mean score of anxiety, depression, and sleep quality index ( $p \leq 0.01$ )

**Table (5): The relation between socio-demographic characteristics of the studied elders and mean score of anxiety, depression, and sleep quality index after implementation of Benson's relaxation technique**

Character s	Mean score of anxiety Mean ± SD			Mean score of depression Mean ± SD			Mean score of Sleep Quality Index Mean ± SD		
	Before the technique	After the technique	Significance test	Before the technique	After the technique	Significance test	Before the technique	After the technique	Significance test
<b>Sex:</b>									
Male	12.557±3.138	6.147±2.279	t= 13.552 P=0.001*	18.016±3.593	6.508±2.134	t=-20.591 P=0.001*	18.409±1.464	12.229±1.637	t=23.985 P=0.001*
Female	13.880±1.563	6.520±1.917	t= 14.445 P=0.001*	19.440±1.781	6.920±1.754	t= 24.535 P=0.001*	18.360±1.150	12.360±1.800	t=16.230 P=0.001*
<b>Age</b>									
60->75	13.105±2.705	6.171±2.199	t=17.621 P=0.001*	18.618±3.136	6.460±2.081	t=27.402 P=0.001*	18.389±1.350	12.276±1.709	t=28.243 P=0.001*
75-<85	11.700±3.560	6.900±1.969	t=5.538 P=0.001*	17.000±3.741	7.900±.875	t=8.125 P=0.001*	18.900±1.523	12.200±1.475	t=8.199 P=0.001*
<b>Marital status</b>									
Single	13.400±0.894	6.800±2.774	t=7.117 P=0.002*	20.200±0.836	6.800±2.774	t=13.015 P=0.001*	18.400±0.894	12.000±0.707	t=26.128 P=0.001*
Married	12.684±3.065	6.017±2.318	t=13.212 P=0.001*	17.982±3.603	6.368±2.192	t=19.861 P=0.001*	18.403±1.521	12.280±1.698	t=23.315 P=0.001*
Widow	13.458±2.466	6.708±1.627	t=12.518 P=0.001*	19.125±2.271	7.208±1.284	t=20.321 P=0.001*	18.375±1.374	12.291±1.805	t=14.026 P=0.001*
<b>Education</b>									
illiterate	13.346±2.382	5.730±2.358	t=11.559 P=0.001*	18.961±2.505	6.192±2.498	t=15.202 P=0.001*	18.576±1.301	12.730±1.866	t=13.418 P=0.001*
Prim & Sec	12.688±2.786	6.355±2.035	t=13.229 P=0.001*	18.155±3.336	6.711±1.791	t=21.422 P=0.001*	18.177±1.511	12.022±1.725	t=20.088 P=0.001*
University & post	13.000±3.683	6.866±2.199	t=5.969 P=0.001*	18.333±4.047	7.133±1.767	t=10.097 P=0.001*	18.733±0.961	12.200±0.941	t=27.640 P=0.001*

## DISCUSSION

End stage renal disease (ESRD) is the most serious consequence of kidney diseases. In that case renal replacement therapies as hemodialysis, peritoneal dialysis and renal transplant become necessary to sustain patients' life. Hemodialysis is a method of removing waste products such as creatinine and urea, as well as excess water from the blood when kidneys failed<sup>(29)</sup>. The results of the current study reported that the majority of the studied elders were married, in young age group with a mean of  $66.256 \pm 6.789$

years while their income not enough. More than one half of the studied elders have basic primary and secondary education (table 1). The same results were reported by other

studies done in Iran by Rambod, 2013, Otaghi, 2016 stated that 55.7% of their participants were married, young old and not have enough income<sup>(9, 27)</sup>.

As for sex, the results of the present study revealed that males constituted two thirds of the studied subjects (table 1). This result is congruent with the literature and the same result was reported by other studies that patients undergoing hemodialysis are predominantly males<sup>(4, 27,30, 31)</sup>. Other studies conducted by Heshmatifar, 2015, Otaghi, 2016 supported this result which concluded that the rate of progression of chronic renal disease is more rapid in men than in women. The impact of gender on renal disease progression may reflect both genetically determined differences between both sexes in renal structure and

function as well as receptor-mediated effects of sex hormones<sup>(4, 27)</sup>.

As regards the duration of being on hemodialysis, the majority of the studied elders were on hemodialysis for less than 5 years (table 2). This finding is in line with other studies conducted in Egypt which revealed that around two thirds of hemodialysis subjects dialyzed for less than 5 years and one third of them on hemodialysis for more than 5 years<sup>(28, 32,33)</sup>. Also the same finding was reported by a study conducted by the Spanish medical institution, 2008 which reported that mean duration of dialysis among elderly patients was 4.3 years<sup>(34)</sup>. On opposite side a study conducted in Hong Kong by Mok, 2001 reported that the majority of their subjects had been on dialysis for more than 5 years<sup>(35)</sup>.

Hemodialysis elderly patients usually experience high levels of psychological stress, anxiety, depression, and sleep disorders. Decreasing these problems, through non-pharmacological methods like Benson's relaxation technique can be effective for decreasing and controlling patients' problems and provides them with more psychological resources to help them to cope with their physical condition. Benson's relaxation (RT) include mindfulness techniques that are affect on wide range of physical and psychological signs and sleep quality<sup>(36)</sup>.

The results of the present study found a significant positive difference in total mean score of anxiety of the studied elders after implementation of Benson's relaxation technique (BRT) (table 3). In this regard, a study conducted in Iran, 2016 by Otaghi found that anxiety in patients undergoing hemodialysis was reduced after the application of Benson's relaxation technique<sup>(27)</sup>. On the same line the study done in Turkey by Yilmaz, 2015, reported that the use of Benson's relaxation technique could lower anxiety in patients<sup>(37)</sup>. Moreover, some studies confirm this result are Mahdavi, 2013<sup>(28)</sup>, reported that application of Benson's relaxation method has a positive result in decrease level of stress, anxiety and pain, and Torabi, 2013, reported that the significant effect of Benson's relaxation method and pressure massage on patients anxiety before kidney transplantation<sup>(38)</sup>. Also a study done in Iran by Kiani, 2017<sup>(16)</sup>, and a study done in India by Mahdavi, 2016 reported decrease level of anxiety with significantly difference after application of Benson's relaxation technique<sup>(28)</sup>. Also this result is congruent with the results of many studies<sup>(39- 41)</sup>. This result may be explained by the Benson's technique is simple, safe technique, effective, in expensive and easy to learn by patients, and do not need any equipment or resources. On opposite side a study done in Yogyakarta by Kurniasari, 2016 who reported that Benson's relaxation technique have no effect on anxiety scores of hemodialysis patients<sup>(42)</sup>. This contradiction may be explained by this paper apply Benson's relaxation for a period of two weeks only and this period was not enough to decrease the level of anxiety while our study conducted for two months.

Depression is the second common psychological effects on elderly patients undergoing hemodialysis. This disorder has adverse effects on the course of disease and treatment process and is recognized as an independent risk factor for

death for hemodialysis elderly patient. The results of the current study reported that a significant positive improvement was found in total mean score of depression of the studied elders after implementation of Benson's relaxation technique (table 3). On the same line a study done in Iran by Heshmatifar, 2015 revealed that the mean score of depression in the intervention group decreased and the difference was statistically significant and Benson's relaxation technique (BRT) is effective in reducing depression in hemodialysis patients<sup>(4)</sup>. Also Lu, 2013 reported that after 10 session of group music therapy, the groups showed statistically significant differences in depression status<sup>(43)</sup>. This result is supported also by a study done in Iran by Barati, 2016, who reported significant difference in depression level among elderly patient before and after application of Benson's technique<sup>(44)</sup>. This result is in the same line with many studies<sup>(38, 45-49)</sup>. On the opposite side a study done in Iran by Otaghi, 2016 who found that Benson's relaxation technique decrease the depression level but without significant difference found<sup>(27)</sup>. Also Mahdavi, 2013, in India reported that no significant difference between the mean score of depression value in study group before and after interventions<sup>(28)</sup>. This contradiction may be explained by high prevalence of depression among their participants, and may be due to limited practiced time period while Benson's technique need prolonged period to be effective.

Coping ability and overall wellbeing may be directly influenced by the amount of restful sleep that they have each night. Proper management of sleep disorders in patients on hemodialysis may yield favorable outcomes both physiologically and psychologically<sup>(50)</sup>. The present study results revealed a significant improvement regarding the global quality of sleep, and all sleep subscales after application of the technique (table 4). On the same line a study done in in Egypt by Masry , 2017 who stated that an improvement in sleep quality scores among study group subjects than control group subjects after implementing of Benson's relaxation technique<sup>(51)</sup>. The results were similar also to findings of Tsay, 2003, who stated that relaxation techniques improve quality of sleep in patients with end stage renal disease<sup>(52)</sup>, and Field, 2002 in USA, observed that increased the number of sleep hours in patients with fibromyalgia after relaxation technique application<sup>(53)</sup>. Other study congruent with our results indicated that some relaxation techniques decreased the sleep disturbance<sup>(54)</sup>. Many studies reported the same finding that Benson's relaxation technique enhance the global quality of sleep in the patients on hemodialysis<sup>(55- 57)</sup>. Another study done in Iran by Rambod, 2013, indicated significant differences between the two groups regarding the scores of Pittsburgh sleep quality index subscales, such as sleep disturbance, daytime dysfunction, the use of sleep medication, and subjective sleep quality and as well as its global scores at the 8th week of the intervention ( $p < 0.05$ )<sup>(9)</sup>. This improvement may be due to Benson's relaxation response promotes a relaxation reaction by reducing the activity of the autonomic nervous system thus promoting better perception of quality of sleep. And also may be explained by when the level of anxiety and depression decrease lead to enhancement of sleep quality.

The results of the present study revealed that there are a significant relation between socio demographic characteristics, and mean score of anxiety, depression, and sleep quality index (table 5). These results are the same line with a study done in Egypt by Masry, 2017, who reported that there was a statistical significant correlation between ages of their subjects and level of pain, and sleep quality<sup>(51)</sup>. This result also is congruent with a study done in India by Mahdavi, 2013, who reported that there were significant relationships between anxiety, stress, and depression with demographic characters such as age, gender, marital status, economic level, and level of education<sup>(28)</sup>. This result may be contributed to Benson's relaxation technique is simple, and easy technique to be learned by any person regardless of age or marital status, or level of education. On the other hand this result was contradicted with many studies conducted by Heshmatifar, 2015, Rahimi, 2006, Patten, 2009 and Roykulcharoen, 2004, who reported no correlation between individual characteristics (patients' age, gender, or educational status) and their pain levels, anxiety, depression level before and after relaxation exercises<sup>(4,49,58, 59)</sup>.

## CONCLUSION

Implementation of Benson's relaxation technique was highly effective in alleviating anxiety, depression, and improving sleep quality in the elderly patients undergoing hemodialysis. There was a significant relationship between socio demographic variables and decrease level of anxiety, depression, and improve the sleep quality.

## RECOMMENDATIONS

Based on the findings of the current study the following recommendations are suggested:

- In service training program to all health care providers and elderly care givers about the effects of Benson's relaxation technique for the reduction of anxiety and stress in elderly patients undergoing hemodialysis.
- Hospitals are recommended to use the Benson's relaxation technique for the management of anxiety, depression and sleep disturbance which accompany hemodialysis for elderly patients.
- Further studies on the impact of this technique with a large number of elderly patients with different chronic illness.

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