Effect of implementing continuous care model on sleep quality of hemodialysis patients

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Abstract

Aims: Sleep disorder is associated with several physical, behavioral and psychological problems. There are some evidences on disturbance of sleep quality in hemodialysis patients. Present study was performed in order to evaluate the effect of applying continuous care model on sleep quality of hemodialysis patients.

Methods: This quasi-experimental study was performed on hemodialysis patients of Goldis hospital of Shahin-shahr during 2008 and 2009. 43 patients were selected by census sampling method. Data collection was performed by Pittsburg sleep quality questionnaire. The applied model contained four steps (orientation, sensitization, control and evaluation). Patients were divided into five groups and 4-6 training sessions during three weeks were held for each group. During the next 9 weeks, consultations for continuous sleep monitoring, control and evaluation were performed. Immediately after intervention and one month later, questionnaires were filled out again. Data were analyzed by SPSS 15, using descriptive and analytic statistics.

Results: According to Pittsburg questionnaire the less score shows the better situation, the mean score of sleep quality before intervention (10.39±3.64) was significantly (p<0.0001) higher than that before intervention (5.54±2.87). In addition, sufficient sleep was seen in 17.4% of patients before intervention, which showed significant increase (p=0.0001) to 55% after intervention.

Conclusion: Performing the continuous care model has positive effect on sleep quality of hemodialysis patients. Training nurses in using this model can improve the sleep quality of hemodialysis patients.

Keywords: Continuous Care Model, Sleep Quality, Hemodialysis

Introduction

Chronic renal diseases are considered as major public health problems all around the world [1]. In Iran and many countries, hemodialysis is the most common treatment of this disease [2]. According to the available statistics at the specific disease management center, from 16 467 patients with advanced renal failure (at the end of 2001), 52% had been treated with hemodialysis, 47% renal transplantation and 1% peritoneal dialysis [3]. Sleep-related complaints have been reported more than 80% for patients with chronic renal failure. Several studies show that sleep apnea, restless legs syndrome, the periodic limb movement disorder and sleepiness are the most common sleep problems in these patients [4].

Despite advances in treatment of these patients, their quality of life is influenced by many factors [5]. To Reimer, the quality of sleeping is inherently linked with the quality of life [6] and Frighetto considers sleeping essential for health and the quality of better life [7]. Sleep is the basis of physiological processes. Normal sleep leads to reduction of sympathetic activity, blood pressure and heart rate [8]. Gustafsson believes that the quality of sleep affects length and quality of life [9]. Disorder in sleep quality is accompanied by physical, behavioral and mental problems and causes some disorders in mental, social and interpersonal interactions [10]. Lack of sleep or sleep disorders may interfere with brain function and reduce the learning ability [11]. 75% of hemodialysis patients, report sleep disorder and 14% show a reduction in sleep quality in the first year of their treatment with hemodialysis [12]. In a study on 89 hemodialysis patients, 71% had insomnia [13]. Thus, the necessity of health, care and prevention cares and application of a care model according to patients’ condition seems necessary [14].

A model called “continuous care model” has been developed and evaluated in Iran by Ahmadi for chronic coronary patients containing four stages including familiarization, sensitization, control and evaluation. In this model, client is introduced as the continuous and influential agent in his health process.

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The continuous care is a regular process for establishing an effective communication and interaction between the client and the nurse as the health-care provider, in order to identify needs, problems and sensitizing patients toward accepting the continuous health behaviors and help the maintenance, improvement and promotion of their health [15]. Ahmadi et al., using this model, investigated the readmission and chest pain in patients with coronary disorders. Results showed that the average frequency of hospitalization was 57% and 51% in the control and experimental group, respectively, before implementation of the model and reduced to 34% and 11% in control and experimental group after intervention that was significantly different [16]. Ghavami evaluated the effect of mentioned model on diabetic patients' life quality [15]. The effect of this model was also studied by Anjomanian, on schizophrenic patients' life quality [17]. In addition, Rahimi studied the effect of this model on hemodialysis patients' quality of life [18]. In all mentioned studies, the positive effect of applying continuous care model has been reported.

Searching several resources in field of hemodialysis patients' care showed that no study has been conducted so far concerning the effect of continuous care model on the quality of sleep and sleepiness of these patients. Therefore, this study was an attempt to design an appropriate care continuous program according to clients' needs to increase the understanding and insight toward the disease and its management and to create a continuous care relationship between the nurse, physicians, patient and family based on continuous care model. Results of this study can be applied by physicians, nurses and all health care providers in care giving and treatment of patients with chronic renal failure. Medical, surgical and pharmaceutical treatments are not, by themselves, able to improve all qualitative aspects of life of these patients. The aim of this study was to evaluate the effect of implementing continuous care model on hemodialysis patients' quality of sleep.

Methods

This quasi-experimental study was conducted on hemodialysis patients in 2008-9 in Goldis Hospital hemodialysis center in Shahin-shahr, Isfahan. 43 patients with end stage renal failure were selected for participation in the study by census sampling method. Patients and their families declared their preparedness to participate in the study consciously through a written consent, after familiarization (with the aim of encouraging cooperation till the end of intervention) and explaining research purposes in a 15-minute session.

Data collection tool was a questionnaire including two parts. The first part included demographic specifications and the information about patients’ disease. The second part was the Pittsburgh Sleep Quality questionnaire that was an evaluation of sleep quality in the four weeks leading to the study. The questionnaire consisted of 9 main questions, one of which contained 5 questions. A point between 0 and 3 was assigned for each question. Seven parts were obtained from the combination of these questionnaire’s questions that the final point of each part was also 3. Sum of the questionnaire seven parts’ scores formed the total score of tools that its range was from 0 to 21. The higher the obtained score, the lower was the quality of sleep. Score higher than 4, was considered as poor quality of sleep [19]. The validity of this questionnaire has been approved for Iranian population by a study by Farhadinasab and Azimi [20]. This questionnaire has been used in several studies and has shown to have high reliability and validity [12, 13, 21, 22, 23]. Nakhae et al. also conducted a study in order to investigate the psychometric features of this questionnaire on 85 patients with post traumatic stress disorder caused by earthquake and 133 healthy individuals, which finally the sensitivity of 100%, specificity of 93% and Chronbach's alpha of 0.89 was obtained for the Persian version of this questionnaire [24].

First, the Pittsburgh sleep quality questionnaire was completed by patients. No intervention was done for a month and periodic tests, problems during hemodialysis, sleep problems, weight and blood pressure were controlled before and after dialysis. At the end of the first month, the questionnaire was completed again. Within the one-month period before the implementation of model, one patient was excluded due to kidney transplantation surgery and two patients due to death and the study was conducted with 40 patients. At this stage, subjects were divided into five small eight-person groups (in order to facilitate access and coordination in group classes, avoid disorders in the dialysis weekly program and also based on the similarity of the needs and problems) and the implementation of the continuous care model began.

Familiarization: was done to create the necessary sensitivities regarding the disease and the aim of this stage was the accurate recognition of the problem, creating motivation and feeling of need and the necessity of follow-up process in patients. In this
phase the researcher held a 10-15 minutes meeting attended by each patient and his family (which was coordinated via telephone or an invitation letter). Patients and researcher expressed their expectations and not to stop care-treatment link was emphasized.

**Sensitization:** This stage was conducted with the purpose of participation of patients and their family in implementation of cares. This phase was held in the form of sessions as counseling, group discussion, lecture, and question and answer (in all five groups, according to the nature and type of needs and problems of patients and their families to discover new problems and emphasize the necessity of following-up of problems). Then counseling was carried out individually before, during and after dialysis session in the research environment with presence of family members and each group expressed their experiences and questions in their desired field. The discussed issues were assessed and summarized by the researcher.

Familiarization and sensitization stages were performed in the first three weeks of model implementation, which totally took three months to complete [18]. With regard to the fact that the aim was investigating the effect of the model on sleep quality, several issues were taken into consideration as follows: explaining about the disease features at the level of patients’ and their families’ understanding; explaining the importance of paying attention to diet and its limitations, physical activity, regular visit by physician and following the given commands; the necessity of paying attention to health and discontinuing improper habits; the importance of behaviors that lead to continuity of care, maintenance of health and control of the disease complications; training the way of creating good habits before bedtime and the way of trying to increase useful sleep hours and factors affecting sleep (nutrition, exercise, drugs, smoking, etc.); sleep hygiene principles (sleep and wake hours, stimuli, the nutrition, drugs, physical activity, sleep environment, etc.); various sleep disorders (insomnia, excessive sleeping and other sleep disorders) and finally addressing the questions and answers of patients and families with emphasis on risk factors.

At this stage some sessions were held to conduct counseling and group discussion by inviting patients and their families to the conference hall of dialysis ward. Number of sessions depended on the rate of knowledge, awareness and similar problems for each subject and on average, 4 to 6 sessions each taking one to two hours were held according to the level of compliance and acceptance of patients and their families. Individual sessions were held during or at the end of hemodialysis session for completing the discussions and helping patients who did not attend the meetings. At this stage, the researcher referred some patients to specialists and subspecialists for problems beyond his job description.

**Control:** This stage was conducted to evaluate and consider new care problems (hospitalization and the way of learned behaviors’ continuity) and to maintain the interactive and reciprocal communication (face to face or via telephone) and consulting was continued. In this study the process of issues’ follow-up took place during each patient’s visit to the center and group meetings.

**Evaluation:** This stage included the investigation of patients’ sleep quality, frequency of weekly dialysis sessions, complications and problems related to sleep quality before, during and after dialysis, vital signs including blood pressure (before, during and after dialysis), dry weight and weight-gain between two dialysis sessions, frequency of visits by physician, etc. Immediately after implementation of the model and a month later the Pittsburgh questionnaire was completed by each patient.

Descriptive statistics including frequency distribution tables, central and distribution indices and inferential statistical methods including paired t-test, one-way ANOVA, Tukey’s test, Chi square test, logistic regression and Pearson test were used for data analysis using SPSS15 software.

**Results**

56.1% of studied patients were male. Mean age of patients were 55.09±16.7, with minimum age of 20 and maximum age of 77 years. Respectively, 48.8% of patients were in the ≥60 years old group, 32.6% in the 40-59 years and 18.6% were in the 20-39 years old group. 72.1% of subjects were married, 18.6% were single and 9.3% were widow or widower. 55.8% of patients reported their income as being in poor level, 39.5% moderate and just 4.7% good. 48.9% of patients were 55.09±16.7, with minimum age of 20 and maximum age of 77 years. Respectively, 48.8% of patients were in the ≥60 years old group, 32.6% in the 40-59 years and 18.6% were in the 20-39 years old group. 72.1% of subjects were married, 18.6% were single and 9.3% were widow or widower. 55.8% of patients reported their income as being in poor level, 39.5% moderate and just 4.7% good. 48.9% of patients evaluated their awareness of the disease as being "low" (Table 1).

The mean of sleep quality score in four measurement stages (two times prior to implementation of the model and two times after it) showed a significant difference (p=0.0001). The results of Tukey’s post hoc test indicated no difference in mean scores in two times before implementation of the model and also two times after its implementation, but mean of scores before using the model showed significant difference
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with mean scores of two times after running the model (in all cases p=0.0001) (Table 2).

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Frequency distribution of some features related to the disease</th>
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<tbody>
<tr>
<td>Variable</td>
<td>Amount</td>
</tr>
<tr>
<td>Being aware of the disease</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Interest in getting information</td>
<td>Yes</td>
</tr>
<tr>
<td>Tolerance for limits of the disease</td>
<td>Completely</td>
</tr>
<tr>
<td></td>
<td>To some extent</td>
</tr>
<tr>
<td></td>
<td>Not in the least</td>
</tr>
<tr>
<td>Family support</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Not in the least</td>
</tr>
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</table>

In addition, the average sleep quality scores, two times before and after implementation of the model, was calculated and compared, which also showed a significant difference (p=0.0001); so that the mean (standard deviation ±) of total scores prior to the implementation of the model was 10.39 (±3.64) and 5.54 (±2.87). After the classification of the total score of sleep quality into desirable sleep (>4 hours) and insufficient sleep (4≥ hours), according to the results of the logistic regression analysis the chance of desirable sleep after implementation of the model became 5.8 times more than before implementation (2.8-11.8) (Table 3).

<table>
<thead>
<tr>
<th>Table 3</th>
<th>The condition of sleep quality before and after intervention</th>
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<tbody>
<tr>
<td>PSQI</td>
<td>Before number</td>
</tr>
<tr>
<td>Desirable(4)</td>
<td>15(17.4%)</td>
</tr>
<tr>
<td>Poor(&gt;4)</td>
<td>44(55%)</td>
</tr>
</tbody>
</table>

Discussion

Prevalence of sleep disorders in patients with chronic uremia is high, compared to common population [25] and in hemodialysis patients may appear after cognitive functions’ disruption [26]. According to the results of this study 83.7% of studied patients had lower sleep quality that is consistent with the results of Mollahoseini et al. who reported sleep disorder in 99.4% of hemodialysis patients [27]. Sabbatini et al. report the prevalence of poor sleep 45 to 80% in dialysis patients [28]. According to Scott et al. 55.2% of patients with end stage renal failure have sleep disturbances [29]. De Niet et al [30] report 66%, Mystakidou et al [31] 73.5% and Baraz et al [32] 74% of patients to have poor sleep quality.

Results of present study showed that low sleep quality of subjects before and after intervention was reduced from 83.7% to 45%. Rahimi et al. showed in a study of the effect of applying continuous care model on hemodialysis patients' quality of life, that in the evaluation of sleep as a part of the SF-36 questionnaire, 63.9% of patients suffer from sleep disturbances and insomnia [33]. Applying continuous care model led to increase in sleep quality so that there was no statistically significant difference between the patients’ sleep quality before and after intervention in this study. Rahimi et al. also show that by applying the continuous care model, significant differences are made in levels of hypertension mean in hemodialysis patients [18]. Raymond et al. show in their study on the effect of continuous care model on stress, anxiety and depression in hemodialysis patients that the mean scores of stress, anxiety and depression before and after intervention have significant difference [21]. Ghavami has also shown the positive significant effect of the mentioned model on diabetic patients’ specific life quality mean [15].

One can be hopeful, by implementation of this model, to gain valuable results in field of improvement and promotion of sleep quality in hemodialysis patients and this model should be used in e nursing education, management and improving the quality of clinical services. Nursing managers should also try to provide conditions in their organizations for enhancement of nurses’ self-confidence so that they can apply their knowledge in providing professional care with power and authority. Thus, the culture and structure of organization will develop and influence of professional power will increase [30].

Conclusion

Running the continuous care model in hemodialysis patients has desirable effect on their sleep quality and improves it. Template nursing boards are guidelines of nursing cares; using nursing models, especially those compatible with the community’s culture, can be
effective in providing nursing cares and the continuity of cares as well as controlling the probable inconsistencies in conducting care. On the other hand, creation and use of client-oriented models can lead to more understanding of people and their health-related needs by nurses.

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References