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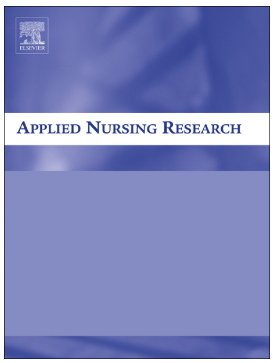

The effect of the emotional intelligence education programme on quality of life in haemodialysis patients

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The effect of the emotional intelligence education programme on quality of life in haemodialysis patients

Running head: Emotional intelligence and quality of life

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Contributions

MS: the conception and design of the study, or acquisition of data, or analysis and interpretation of data, drafting the article or revising it critically for important intellectual content, final approval of the version to be submitted.

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Conflict of interests

None declared by the authors

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Ethical approval

The research council affiliated to Tehran University of Medical Sciences (Decree number = 9111196059-112844) accepted the research protocol, supported it financially, and fully corroborated its ethical consideration which conforms to the provisions of the Declaration of Helsinki in 1995, revised 2001.

The effect of the emotional intelligence education programme on quality of life in haemodialysis patients: A quasi-randomized controlled trial

Abstract

Aim: This study investigated the effect of the emotional intelligence education programme on quality of life of haemodialysis patients.

Background: Nurses need knowledge development regarding the impact of educational strategies on patients' quality of life suffering from chronic diseases.

Methods: A pragmatic quasi-randomized controlled trial was conducted with 47 haemodialysis patients attending a university hospital in an urban area of Iran. The patients were randomly assigned to intervention (n = 23) and control (n = 24) groups. A socio-demographic questionnaire, the Cyberia-Shrink Emotional Intelligence Questionnaire, and the Kidney Disease Quality of Life-Short Form were used to gather data. The intervention group attended an educational programme on emotional intelligence that consisted of six-group discussion sessions. To ensure the continuity of learning and to measure the subsequent expected behavioural changes, the patients filled out the data collection tools six and 12 weeks after the completion of the education programme.

Results: The mean score of quality of life in the intervention group was 39.94 ± 15.88 in pre-test, 44.87 ± 16.04 six weeks and 52.47 ± 16.07 at the 12 weeks after the intervention ($p = 0.032$).

Conclusion: The consideration of emotional intelligence educational strategies by nurses requires its incorporation into pre-qualifying nursing degrees and professional development programmes. Nurse managers need to lead nurses for applying emotional intelligence in daily practice with the aim of providing an holistic patient care.

Keywords: Chronic renal failure, haemodialysis, emotional intelligence, quality of life.

INTRODUCTION

End-stage renal disease (ESRD) is a chronic, progressive and irreversible disease. It is diagnosed when kidney function is less than 10% of the normal function. The function of kidneys in the regulation of electrolytes and the excretion of waste materials is severely impaired, which is accompanied with an increase of Blood Urea Nitrogen (BUN) and creatinine in the blood as well as electrolyte imbalance. However, haemodialysis is not capable of stimulating bone marrow to haematopoiesis and secretion of hormones (Smeltzer, Brenda, Janice, & Hinkle Kerry, 2010).

A recent systematic review showed that in 2010 the number of patients receiving renal replacement therapy worldwide was 2.6 million, of which almost 80% were undergoing haemodialysis (Liyanage et al., 2015). According to the report of "Association of Supporting Patients with Renal Disease" in Iran, of 40000 patients with renal disease, 15000 patients were undergoing haemodialysis, and 500 of which died due to the complications of the disease (Rahimi, Baljani, & Zadgasem, 2012).

Although treatment modalities, such as haemodialysis, improve patient survival rates, they can also negatively affect all aspects of patients' life and may lead to physical complications (Smeltzer et al., 2010). About one half of patients on haemodialysis typically experience multiple symptoms such as pain, fatigue, pruritus and constipation (Caplin, Kumar, & Davenport, 2011). They may also experience a variety of other complications such as limited activities due to changes in diet, feeling of social insecurity, being dependent on others and changes in quality of life (QoL) (Rahimi et al., 2012).

It is believed that chronic diseases are often associated with poor QoL (Feroze et al., 2011). Those mental and social health issues that affect haemodialysis patients depend largely on the level of stress experienced by the patients. Mental pressures damage the patients' mental well-

being and cause psychological problems and social isolation (Theofilou, 2011). Therefore, it is critical for nurses to improve their understanding of the impact of chronic diseases and treatment modalities such as haemodialysis on patients' QoL (Mahmoudi, Shariati, & Behnampour, 2003). Health-related QoL has taken an increasing importance as an index of the success of healthcare interventions (Fructuoso, Castro, Oliveira, Prata, & Morgado, 2011). In 1998, the World Health Organization (WHO) defined QoL as 'one's perception of his/her position in life in relation to his/her goals, expectations, standards, and concerns within the culture and values of the society they live in' (WHOQoL Group, 1998, p. 551-558). QoL is a multifaceted and relative concept determined by time, place and personal values (Ferrans, & Powers 1992). The QoL of haemodialysis patients is affected by emotion-focused coping strategies and cognitive processing, which can both be affected by social-environmental and situational factors related to emotional intelligence (EI). (Mahmoudi et al. 2003). EI can be broadly defined as an individual's ability to perceive, control and evaluate emotions. This set of characteristics, which deal with the perception, expression and regulation of moods and emotions, suggests that there must be a direct relationship between EI, physical and psychological health (Johnson Batey, & Holdsworth 2009; Tsaousis & Nikolaou, 2005). Goleman and Cherniss (2001) believes that EI consists of four skills including 'self-awareness', 'self-management', 'social awareness' and 'relationship management'. Mayer, Salovey, and Caruso (2000) introduced the concept of 'emotional literacy' and concluded that EI involved five skills, namely self-awareness (awareness of one's self and recognition of feelings and affections as they are), empathy (sensitivity to interests and feelings of others), self-regulation (appropriate control of emotions), motivation (setting goals), and social relationships (relationship management). Individuals with high EI are able to control their feelings as well as others, distinguish between positive and negative consequences, utilize their

affective data to guide their own thoughts and activities. They can also provide themselves with more opportunities to think and are more creative and use their emotions and feelings for solving their own problems (Sobhaninejad, & Yoozbashi, 2008).

Since the levels of EI in individuals are determined by not only their instinctive capacity, but also their experiences, EI can be improved by education, practice and experience (Liu, Wang, & Lü, 2013). The certain aspects of EI can help improve QoL in the middle-aged population (Fernández-Berrocal, Salovey, Vera, Extremera, & Ramos, 2005). Findings of a study on 36 patients with Type II diabetes in Turkey indicated that teaching the components of EI enhanced QoL and improved well-being (Yalcin, Karahan, Ozcelik, & Igde, 2008). Appropriate education strategies help nurses create positive changes in hemodialysis patients' QoL (Parvan et al. 2015).

Background

Due to the progressive growth of the number of haemodialysis patients in Iran and the impact of this therapeutic method on all aspects of patients' life, sufficient attention should be given to QoL and its related factors for the provision of appropriate care to these patients (Theofilou, 2011). Nursing care for haemodialysis patients currently focuses on the education of patients regarding diet, fistula and shunt care, use of medications and adherence to therapy (Hall et al., 2012). Therefore, the psychological and emotional aspects of haemodialysis care including stress reduction, prevention of depression and anxiety and development of social relationships are the unaddressed elements of patient care. Since the provision of care to haemodialysis patients is complex and requires long-term follow-ups, educational programmes that enhance QoL can facilitate the development of strategies to cope with the disease and its subsequent ramifications and improve patient involvement in their own care (Yalcin et al., 2008).

Some studies have been conducted in the field of EI and with various samples including teaching staff, students, nurses and physicians, but a few studies have focused on patients, particularly haemodialysis patients. In a study entitled the effects of the EI programme on QoL and well-being of patients with Type 2 diabetes mellitus, a 12-week EI programme was administered. At the end of the programme. The levels of QoL, well-being, and EI in patients increased compared with the control group. The positive effect of the programme on the study group's quality of life, wellbeing, and EI persisted at the 3- and 6-month follow-up (Yalcin et al., 2008). Nooryan et al. (2011) investigated the effects of EI education on job-related stress among physicians and nurses working in an intensive care setting. The intervention group received six sessions of education on EI. A statistically significant difference was reported between the intervention and control groups after education. Fathi, Adibsereshki, and Sajedi, (2014) studied the effect of an EI education programme on aggression and hyperactivity among students with physical disability. They reported that the EI education programme reduced the aggression and hyperactivity of students. Fernández-Abascal and Martín-Díaz's study (2015) of 855 undergraduate students showed that the dimensions of EI were better predictors of mental health than of physical health. The dimensions of EI affecting mental health were well-being, self-control, sociability and attention. Also, well-being, self-control and sociability were judged to affect physical health positively.

Compared to patients with other chronic diseases, haemodialysis patients may face greater challenges to adapt to their health condition. In fact, complications caused by haemodialysis and changes in patients' lifestyle, health, social roles and QoL may lead to lower self-esteem, as well as emotional and behavioural problems (Theofilou, 2011). So, a more special programme of EI education is needed for haemodialysis patients to cope with their healthcare conditions. Due to

the lack of studies on EI in haemodialysis patients in nursing literature, this study aimed to investigate the effect of an EI education programme on QoL among patients undergoing haemodialysis.

METHODS

Study design

A pragmatic quasi-randomized controlled trial was conducted from July 2014 to January 2015.

Sample and setting

This trial was carried out on patients with ESRD referred to the haemodialysis ward of the only university hospital in an urban area of Iran. This haemodialysis ward contained 17 beds with three active work shifts. While the morning and evening work shifts were specified to the scheduled haemodialysis of patients, night work shifts were for critically ill patients and emergency situations, Patients were specified as scheduled (odd or even days) to undergo haemodialysis. In each of the morning and evening work shifts, three bachelor degree nurses and two other healthcare workers were working.

A convenient sampling method was used. All patients attending the haemodialysis ward at the university hospital study site, were the total sample (n=105). The inclusion criteria were: being literate, having undergone haemodialysis for at least three months, a weekly dialysis schedule of 3-4-hour sessions, no complications such as fever, thrombosis or bleeding, no history of participation in an EI education programme and willingness to take part in this study.

51 patients were identified as being eligible to participate in this study. Four patients were excluded because of two sessions of absence from haemodialysis, hospitalization and unwillingness to participate in this study. Therefore, 47 patients were recruited and randomly allocated to the intervention (n = 23) and control groups (n= 24).

Randomization

According to the patients' referral days to the haemodialysis ward, they were assigned to the intervention or control arm. The toss of a coin decided that patients referred on odds and even days were assigned to the control and intervention groups, respectively. This prevented contamination of the samples between the groups. The administrators used no criteria with regard to the referral days of the patients throughout the days of the week and no especial days allotted to certain patients. In line with the working days of Iran, the patients booked for dialysis from Saturday to Wednesday without any specific criteria.

Ethical considerations

The study research proposal was approved by the Ethics Committee affiliated with Tehran University of Medical Sciences that corroborated its ethical considerations (decree number: 91111960-112844). The RCT's protocol was registered at the IRCT with the number: IRCT2014112520082N1. Permissions were also obtained from hospital authorities to enter the research site. The patients were informed of the study's aim and method. They were assured of data confidentiality, anonymity and their right to withdraw from the study at any time without any impact on care delivered to them. Those who agreed to take part in this study signed written informed consent forms.

Data collection

Three questionnaires were used for data collection: (i) the socio-demographic characteristics questionnaire, (ii) Kidney Disease Quality of Life-Short Form (KDQoL-SF36) questionnaire, and (iii) Cyberia-Shrink EI questionnaire.

The socio-demographic characteristics' questionnaire contained questions on age, gender, the marital status, education level, number of children, employment status, type of insurance and duration of haemodialysis. It was completed by either directly asking the patients or checking their medical records. This tool was given to ten nurse instructors who confirmed its content validity.

The KDQoL-SF36 questionnaire was used to assess the QoL of the patients. This questionnaire contained general and specific items. The general items dealt with physical and psychological health status divided into eight domains including 'physical function', 'general health', 'general health perceptions', 'pain', 'emotional reactions', 'social function' and 'the effect of disease on life and happiness' (Yekaninejad, Mohammadi Zeidi, Akaberi, Golshan, pakpour, 2012). The specific items contained questions related to 'the symptoms of the disease', 'effects of kidney disease on daily life', 'employment status', 'changes associated with the disease', 'sexual function', 'sleep status' and 'patients' satisfaction with the healthcare staffs'. The KDQoL-SF36 questionnaire was translated to Farsi by Yekaninejad et al. (2012). The scores of the KDQoL-SF36 questionnaire ranged between 0 and 100 and was reversed for negative items. Two-option items were scored as either 0 or 100. Three-option items were scored as 0, 50 or 100. Four-option items were scored as 0, 33.33, 66.66 or 100. Five-option items were scored as 0, 25, 50, 75 or 100. Six-option items were scored as 0, 20, 40, 60, 80 or 100. Item #23 had seven options each of which was scored as 100. Since the standard mean score of QoL was 50, scores higher than 50 indicated a higher level of QoL and those lower than 50 indicated poorer QoL. The validity and reliability of the KDQoL-SF36 questionnaire in Farsi were determined by Yekaninejad et al (2012). The reliability of the questionnaire was confirmed by calculating the Cronbach's alpha coefficient (0.71-0.96 for specific items and 0.73-0.93 for general items).

Moreover, the high intragroup correlation coefficients (0.77-0.92 for specific items and 0.79-0.92 for general items) showed the acceptable reliability of the KDQoL-SF36 questionnaire.

The Cyberia Shrink EI questionnaire was a standard questionnaire contained 70 items, each describing a particular situation in life. The patients were asked to imagine themselves in that situation and choose the option that best matched their mental status (Livarjani, Gol Mohammad Nejad, Shahanagi, 2009). After translation from English to Farsi and eliminating 47 items that were irrelevant or/and not consistent with the Iranian context and culture such as 'alcohol consumption', 'participating in parties and clubs', and also emotional and situations that an Iranian does not experience, the number of items was reduced to 33 items. The validity and reliability checking of this questionnaire showed that its structural validity was preserved even after the above-mentioned changes in the items. This questionnaire measured all dimensions of EI. Items 1, 9, 15, 20, 21, 26 and 31 dealt with self-motivation. Items 6, 10, 12, 14, 24, 27, 32 and 33 assessed self-awareness. Items 2, 5, 11, 16, 18, 23 and 30 evaluated self-control. Social intelligence was measure through items 3, 4, 17, 22, 25 and 29. Lastly, social skills were assessed using items 7, 8, 13, 19 and 28. All items were scored on a 5-point Likert scale from always = 1 to never = 5. Items 1, 9, 12, 13, 14, 18, 20, 22, 28, 31 and 33 were reversely scored. The total scores of the questionnaire ranged between 33 and 165. The reliability of the Farsi version of this questionnaire was assessed in terms of internal consistency using the calculation of the Cronbach's alpha coefficient, which was reported as 0.85. The construct validity of this questionnaire was also confirmed by assessing correlations between its scores and scores of the Copper-Smith Self-Esteem Scale (Coopersmith, (1967) in a sample of 30 individuals (Yousefi & Safari, 2010).

Intervention

As the pre-test, before the intervention, both groups were asked to fill out the three questionnaires. Both groups then received the customary educational provision about diet, limitations of fluid intake, activity limitation, taking care of their fistula, adherence to medication, routine visits by the physician and the requirement for monthly laboratory testing.

The patients in the intervention group were divided into six groups with four patients in each group, that attended the EI education programme. This programme was run twice weekly for six consecutive weeks. The educational sessions were held after the completion of haemodialysis and lasted for at least 30 minutes depending on patients' health conditions. A nurse who was not the member of the research team and had sufficient education and training on EI techniques run the education sessions based on the Tiregee's training protocol (2005) including five EI skills: 'self-awareness', 'self-management', 'empathy', 'relationship management' and 'emotion control'. Sessions on 'self-awareness' started by describing the characteristics of self-awareness in patients and continued by a focus on self-knowledge, identification of one's strengths and weaknesses based on one's own opinion and others' views, and the development of a positive view of oneself and some exercises were also provided. For instance, during 'self-management' sessions, the methods of identifying problems and finding solutions were discussed and relevant exercises were provided. Sessions on 'empathy' sought to improve the patients' empathizing skills by focusing on techniques such as listening, disclosing feelings and considering the feelings of others. 'Relationship management' sessions tried to promote effective relationships by describing the use of body language, the benefits of interpersonal relationships and disadvantages of isolation. 'Emotion control' sessions taught the participants how to recognize their own emotions and discussed anger and anxiety control techniques. All patients attended each educational session and all educational content was presented in the form of group

discussions and homework, and educational booklets were given at the end of each session. At the beginning of the educational sessions, the researcher's phone number was given to the participants and they were asked to call should they have any question. At the end of each session, the participants were provided with questions on the session's topic so testing the main points addressed in each session to ensure their learning. Also, during the follow-up, the researcher would send each participant a text message weekly to remind them to use the skills they had been taught and to answer their questions, if any. At the post-test, six and twelve weeks after the last session, the participants in both groups were asked to complete the KDQoL-SF36 and Cyberia Shrink EI questionnaires again. Similar to a previous study (Yalcin et al., 2008), to ensure of the follow up and application of the techniques by the patients over time, EI was assessed twice after the intervention. It is noted that two participants from each group were excluded from this study at six weeks and twelve weeks after the intervention due to a lack of following up the intervention and declining to fill out the questionnaires. Therefore, data analysis was carried out with 21 and 22 participants in the intervention and control groups. A summary of the study process based on the CONSORT flow diagram (2010) was presented in Figure 1.

Data analysis

Descriptive and inferential statistics were used to analyse data. Data were analysed using the SPSS v.16.0 software (SPSS Inc., Chicago, IL, USA). The homogeneity of the two groups in terms of demographic variables was determined using independent t-test for quantitative data and chi-square test for qualitative data. Independent t-test was also performed to evaluate the homogeneity of the two groups in terms QoL and EI scores. The repeated measures analysis of variance with Sidak post hoc test was applied to compare the scores of QoL and EI before the intervention with those six and twelve weeks after the intervention.

RESULTS

Socio-demographic characteristics of the patients

Most patients in both groups were male (Figure 2) with the age range between 30 and 39 years. They were mostly married (57.14% in the intervention group and 63.64% in the control group). Also, 45.45% and 54.54% (intervention and control groups, respectively) had an education level of elementary or junior high school. The majority of the patients in the intervention group (90.48%) and control group (81.82%) had inadequate monthly incomes. In addition, 66.67% of the patients in the intervention group and 72.73% of them in the control group were non-smokers**.** Their mean systolic blood pressure was 132.85 ± 2.65 and 124.32 ± 4.73 mmHg in the intervention and control groups, respectively. Their mean diastolic blood pressure was 72.8 ± 2.4 mmHg in the intervention group and 68.18 ± 2.86 mmHg in the control group. According to table 1, except for the systolic blood pressure, the two groups were homogeneous in terms of all demographic characteristics ($p>0.05$).

EI and QoL

The participants in the intervention and control groups had no statistically significant difference in EI scores before the intervention (42.00 ± 10.22 *vs.* 40.35 ± 10.51, respectively, $p = 0.62$). Likewise, no statistically significant difference in the pre-test scores of QoL was observed between the groups (39.94 ± 15.88 in the intervention group *vs.* 39.25 ± 15.53 in the control group; $p = 0.8$). Therefore, the two groups had no statistically significant differences in terms of EI and QoL before the intervention.

All five domains of EI including ‘self-awareness’, ‘self-control’, ‘empathy’, ‘self-motivation’ and ‘social skills’ significantly improved in the intervention group after the intervention (Table 2). Moreover, the total score of EI in the intervention group increased from 42.00 ± 10.22 before

the intervention to 58.24 ± 8.66 twelve weeks after the intervention (p = 0.003). Such improvements highlighted the effectiveness of our intervention in the intervention group. Although the total scores of EI in the control group slightly decreased from 40.35 ± 10.51 before the intervention to 40.04 ± 10.33 twelve weeks after the intervention, no statistically significant difference existed between these scores (Table 2).

There were statistically significant differences between the intervention and control groups in terms of the mean scores of both specific and general dimensions of QoL. Therefore, the EI education programme improved all domains of QoL. The total score of QoL in the intervention group increased from 39.94 ± 15.88 before the intervention to 44.87 ± 16.04 and 52.47 ± 16.07, respectively six and twelve weeks after the intervention (p = 0.032). Such increments confirmed the effect of our intervention on the promotion of the patients' QoL (Tables 3, 4; Figure 3).

DISCUSSION

EI as a core aspect of emotional competence, is a useful tool for improving QoL and individuals' performance (Ignat & Clipa, 2012). This notion is confirmed by the findings of this study indicating a significant increase in the scores of QoL in the intervention group after the EI education programme. Among the specific domains of QoL, the intervention group scored the highest (54.66) in disease-related symptoms before the intervention. A probable reason was the patients' short history of haemodialysis. This group also scored 27.27 in the job status. Our results were confirmed with those reported by Yekaninejad et al. (2012) in Iran and Sesso, Rodrigues-Neto, and Ferraz (2003) in Brazil, which indicated the presence of employment problems in all haemodialysis patients influencing their QoL. Before the intervention, the highest and lowest scores among the general domains of QoL belonged to physical function (75.00 in the intervention group *vs.* 69.09 in the control group) and emotional role (24.12 in the intervention

group *vs.* 22.12 in the control group). Salami (2010) reported similar findings in students from a college of education in Nigeria.

The score of cognitive state in the intervention group increased after the intervention, that supported the Yousefi and Safari's (2010) study findings of 403 students in Iran. They showed that EI education increased students' self-awareness and -knowledge. The scores of social interactions and social function domains of QoL in the intervention group significantly increased after the intervention. Brackett et al. (2006) likewise described a direct relationship between EI and social ability and functions.

The intervention of the EI education programme significantly increased the mean scores of satisfaction with life in patients with long-term conditions. In line with our findings, Furnham and Petrides (2003) in a study of 120 Cypriot participants and Ciarrochi, Deane, and Anderson (2002) in a study of university students stated that individuals with high EI could better cope with problems in life and were more satisfied with life.

A statistically significant increase in happiness and vitality as the general domains of QoL in the intervention group was reported. Similarly, Downey et al. (2008) investigated the relationship between EI and the clinical diagnosis of depression in a cohort of adults. They described a relationship between EI and depression and concluded that people with high EI were happier, because teaching EI improved QoL. Our findings demonstrated an increase in the scores of general health domain of QoL following EI education. Likewise, Petrovici and Dobrescu (2014) in a study on 250 students in Romania reported that the EI education programme promoted individuals' QoL and health.

Despite the considerable results of the study, changes in the dimensions of QoL have not been significant in all aspects. The reasons may have been because of nature and physiology of the

disease, disease duration and socio-demographical characteristics of the patients. Consequently, other therapeutic and educational methods are suggested to be used alongside EI education to improve its effectiveness. The EI education programme significantly increased the mean total scores of QoL of the patients. According to Yalcin et al. (2008), the education of EI skills enhanced the QoL of 36 patients with Type II diabetes in Turkey. These results are all consistent with our findings and confirmed our hypothesis that the EI education programme would improve the QoL of haemodialysis patients.

Study limitations and suggestions for future studies

The main limitation of this pragmatic quasi-experimental trial was the selection of a small sample size from one teaching hospital. It is noted that all patients referred to the educational hospital were included in this study and the recruitment of more patients was impossible. Another limitation of this study was that the Cyberia Shrink EI questionnaire was revised based on Iranian culture and context, which needs a cautious generalization of results of the present study to other contexts. Future studies are required with a larger sample size and in different culture and context to improve the generalizability of our findings to other healthcare settings.

CONCLUSION

The aim of treatment modalities such as haemodialysis is the increase of patients' survival rates and improvement of their QoL. Findings from this study provides evidence for nurses and nursing managers to provide EI education programmes to enhance the QoL of haemodialysis patients. The consideration of EI improvement strategies in patient care by nurses requires its incorporation into the curricula of pre-qualifying nursing degrees and within continuing professional development programmes.

It is noted that emotional intelligence is considered a crucial part and motivator of high quality nursing care (Jönsson, 2012). Also, the establishment of a favourable, empowering and creative workplace needs nurses to achieve emotional intelligence skills (Heckemann, Schols, & Halfens, 2015; Echevarria, Patterson, & Krouse, 2017). Therefore, nurse managers are needed to achieve EI knowledge and skills in order to lead and educate nurses to apply an holistic perspective in terms of physical, psychological and emotional aspects of patient care in daily practice. Further research to evaluate the relationship between the application of EI by nurse managers and the quality of nursing care is recommended. The effects of the EI education programme on other aspects of chronic diseases such as depression, anxiety, and self-efficacy need investigations.

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Table 1. Socio-demographical characteristics of the patients

Variables	Intervention (n = 21)	Control (n = 22)	P value
Gender, n (%)			
Male	11(52.38%)	14(63.64%)	0.455
Female	10(46.62%)	8(36.36%)	
Age, n (%)			
≤ 20	1(4.76%)	0	
20 – 29	5(21.81%)	5(22.72%)	0.34
30 - 39	11(52.38%)	8(36.36%)	
40 - 49	3(4.76%)	7(31.82%)	
>50	1(4.76%)	2(9.1%)	
Marital status, n (%)			
Married	13(61.9%)	14(63.64%)	0.57
Single	8(38.1%)	8(36.36%)	
Systole blood pressure, n (%)			
< 100	0	5(27.73%)	
100 - 119	1(4.76%)	3(13.64%)	0.001
120 - 139	13(61.91%)	8(36.36%)	
≥ 140	7(33.33%)	6(27.27%)	
Diastolic blood pressure (n %)			
< 80	13(61.90%)	14 (63.64%)	
80 - 89	7(33.33%)	6(27.27%)	0.96
90 - 99	1(4.76%)	2(9.1%)	
Job status (n%)			
Unemployed	14(66.67%)	13(56.09%)	
Practitioner	0	2(9.09%)	
Retired	2(9.52%)	3(13.64%)	0.05
Housewife	5(23.81%)	4(18.18%)	
Smoking status (n%)			
Yes	7(33.33%)	6(27.27%)	0.66
No	14(66.67%)	16(72.73)	
BMI			
Underweight	4(19.05%)	8(36.36%)	
Proportional	11(52.38%)	11(50%)	0.15
Overweight	4(19.05%)	2(9.1%)	
Obese	2(9.1%)	1(4.54%)	
Duration of haemodialysis (year)(n%)			
<2	4(19.05%)	6(27.27%)	
2 - 4	7(33.33%)	6(27.27%)	0.29
5 - 7	6(28.57%)	5(22.73%)	
7<	4(19.05%)	5(22.73%)	

Table 2. The mean scores of EI and its dimensions

EI dimensions	Group	Before the intervention		Six weeks after the intervention		12 weeks after the intervention		P-value
		Mean	SD	Mean	SD	Mean	SD	
Self-awareness	Control	12.28	42.41	10.42	43.30	12.61	40.62	< 0.001
	Intervention	12.61	40.62	8.80	49.52	7.07	56.69	
Self-control	Control	12.11	33.76	11.27	33.20	9.44	33.86	0.001
	Intervention	12.14	37.27	11.15	46.61	9.62	50.02	
Empathy	Control	8.54	34.46	12.58	35.60	8.27	34.65	0.001
	Intervention	9.43	39.73	11.63	54.16	9.02	58.67	
Self-motivation	Control	8.25	47.07	9.36	46.26	9.72	47.24	0.001
	Intervention	8.98	46.84	9.02	62.14	9.23	65.57	
Social skills	Control	11.40	45.93	13.01	43.63	11.64	43.86	0.001
	Intervention	8.98	46.84	9.02	62.14	9.23	65.57	
Total score	Control	10.51	40.35	11.33	40.39	10.33	40.04	0.002
	Intervention	10.22	42	9.95	53.23	8.66	58.24	

EI: emotional intelligence

Table 3. Mean scores of specific QoL and its domains

QoL dimensions	Group	Before the intervention		Six weeks after the intervention		12 weeks after the intervention		P-value
		Mean	SD	Mean	SD	Mean	SD	
Signs and symptoms	Intervention	54.66	13.14	57.74	11.91	56.68	12.45	0.541
	Control	57.31	13.79	57.12	13.25	57.84	13.19	
Effects of kidney disease	Intervention	30.35	11.74	31.52	12.94	32.18	14.79	0.301
	Control	31.82	15.41	31.53	13.84	30.39	14.08	
Employment	Intervention	26.19	30.07	26.19	30.07	27.27	30.52	0.964
	Control	27.27	29.79	25	29.88	25	29.88	
Cognitive state	Intervention	41.24	14.85	50.01	15.83	58.25	12.97	0.033
	Control	40.30	16.26	40.00	15.66	40.00	14.25	
Sleep	Intervention	49.52	15.43	56.06	12.73	62.34	10.30	0.040
	Control	48.18	12.83	48.48	12.87	48.25	11.80	
Social support	Intervention	35.31	17.85	43.33	17.04	53.42	21.67	0.034
	Control	34.84	16.98	34.09	18.16	31.81	16.19	
Satisfaction with disease	Intervention	36.35	9.55	43.22	10.66	48.64	13.84	0.023
	Control	33.76	7.03	34.53	7.86	34.96	7.88	
Satisfaction with personnel	Intervention	49.40	19.15	61.88	20.36	71.04	22.15	0.043
	Control	49.43	17.02	48.86	17.21	52.27	14.75	
General health	Intervention	41.00	15.05	49.80	12.73	56.61	10.33	0.011
	Control	38.13	9.27	42.42	10.07	41.91	10.10	
Social interactions	Intervention	34.62	16.72	54.49	10.20	63.14	9.08	< 0.001
	Control	31.51	17.11	34.24	14.14	33.33	15.11	

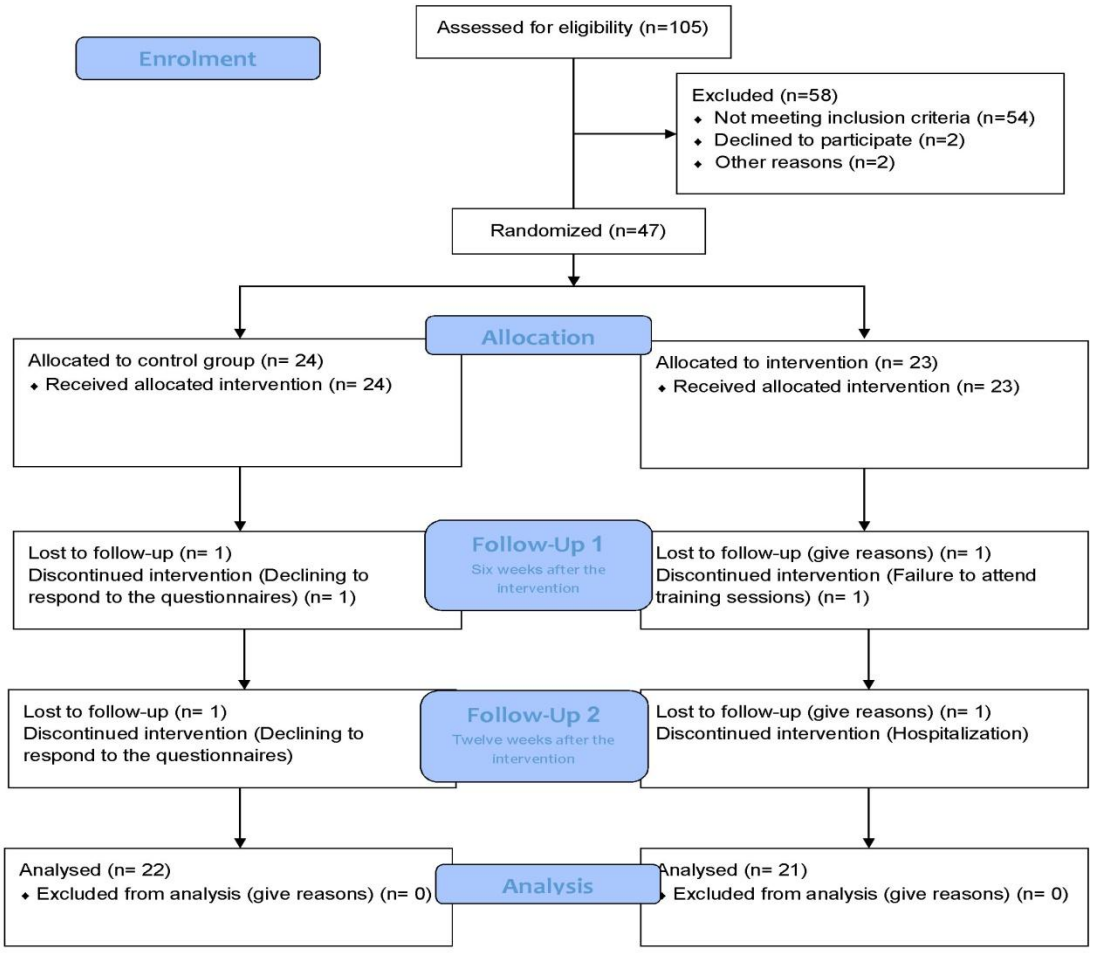
QoL: Quality of life

Table 4. The mean scores of general QoL and its dimensions

QoL dimensions	Group	Before the intervention		Six weeks after the intervention		12 weeks after the intervention		P-value
		Mean	SD	Mean	SD	Mean	SD	
Physical role	Intervention	45.23	11.92	53.96	13.84	60.31	12.33	0.053
	Control	48.48	13.51	45.45	13.78	46.21	13.54	
Physical function	Intervention	75	13.13	75.71	10.52	71.90	1.89	0.912
	Control	89.06	15.01	77.50	34.32	74.54	10.45	
Bodily pain	Intervention	51.32	24.71	48.14	17.68	51.85	17.86	0.391
	Control	56.06	17.67	55.55	17.48	53.53	18.34	
General health	Intervention	33.33	10.88	45.23	10.62	63.60	9.33	0.048
	Control	36.36	15.74	37.34	13.72	38.60	13.16	
Happiness and vitality	Intervention	31.90	10.54	47.23	15.75	55.38	16.76	0.001
	Control	31.36	10.59	32.68	9.75	33.45	9.21	
Social function	Intervention	28.90	6.93	46.14	14.02	51.14	16.13	< 0.001
	Control	22.13	7.60	30.06	10.64	31.22	11.39	
Emotional role	Intervention	24.12	24.08	29.20	22.05	27.93	20.50	0.371
	Control	22.12	17.26	22.42	17.52	21.81	16.98	
Sexual functions	Intervention	51.78	18.89	53.14	21.53	58.62	17.28	0.584
	Control	54.50	24.75	49.03	24.18	46.15	20.65	
Total score	Intervention	39.94	15.88	44.87	16.04	52.47	16.07	0.032
	Control	39.25	15.35	40.18	16.55	39.82	16.68	

QoL: Quality of life

Figure 1. The process of the study according to the CONSORT flow diagram (2010).



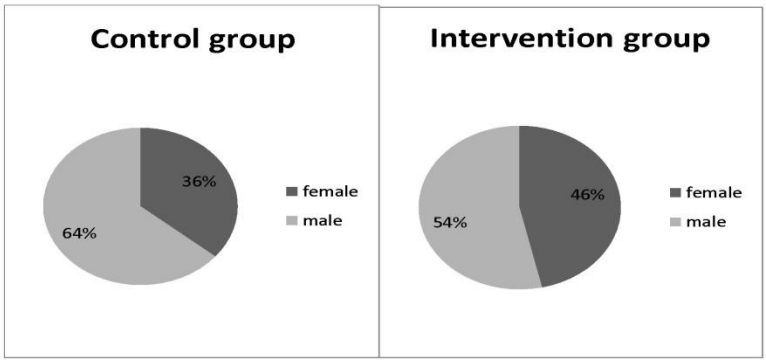


Figure 2. The gender comparison of the samples in the groups

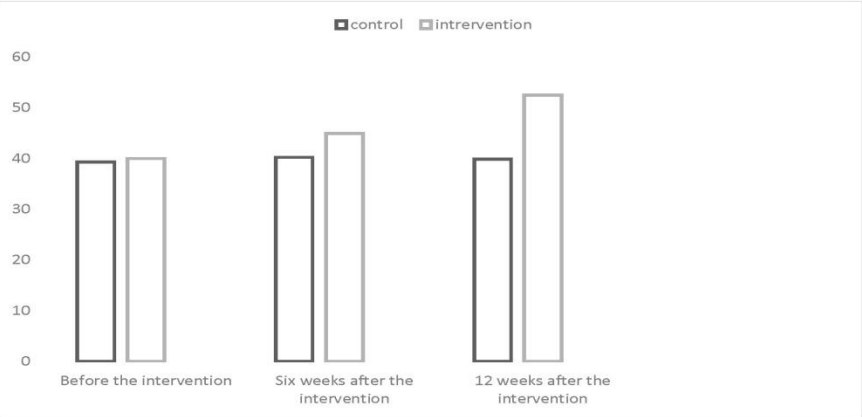


Figure 3. The changes in the scores of total QOL in the groups

Highlights

- Haemodialysis can improve patient survival rates, but it also negatively affects all aspects of patients' life;
- The emotional intelligence education programme can significantly increase the mean total scores of quality of life of haemodialysis patients;
- The consideration of emotional intelligence improvement strategies in patient care by nurses requires its incorporation into the curricula of pre-qualifying nursing degrees and within continuing professional development programmes.