Chapter II Review of Literature

REVIEW OF LITERATURE

In this chapter, researcher focuses on the published and unpublished scientific papers analyzing the physical and psychological impact of CKD and related haemodialysis on the people, their treatment adherence and outcome, on various psychosocial interventions including CBT in alleviating anxiety and depression or improving adherence and quality of life among people undergoing haemodialysis. The information was sought through hand search, on-line sources (CINAHL, PubMed/MEDLINE, Pro Quest, Science direct, Cochrane library, Ovid SP, MD Consult, Google Scholar, Scopus and Springer link) and contacting the authors in some instances. The review of literature is organized under three main parts and the part A and C are further divided into two and five subparts respectively.

Part A: Impact of haemodialysis
   A1. Physical impact of haemodialysis
   A2. Psychological impact of haemodialysis

Part B: Treatment adherence and outcome

Part C: Interventions for the people undergoing haemodialysis
   C1. Psychosocial interventions to reduce anxiety and depression
   C2. Psycho social interventions to improve quality of life
   C3. Psycho social interventions to improve adherence
   C4. Cognitive behaviour therapy to reduce anxiety, depression and to improve quality of life
   C5. Cognitive behaviour therapy to improve adherence
Part A: Impact of haemodialysis

The patients with an end stage renal failure will virtually face complications in every organ system and the commonly encountered psychiatric complications are depression, anxiety, dementia, delirium, coping difficulties and marital or family problems. There are numerous sources of severe psychological stress, including chronic fatigue, other physical symptoms, excessive dependence on other people, loss of previous social functioning and difficulties in maintaining hope in the face of uncertain future. These problems along with stress related to the health status, social relationships and social and vocational functions often show profound quality of life complications.33

A1. Physical impact of haemodialysis

The individual with CKD faces many physiological and cognitive problems due to metabolic abnormalities, toxic condition from organ failure and major lifestyle changes brought about by ongoing haemodialysis treatment and related complications. Maintaining quality of life, adjusting to haemodialysis, coping with chronic depression and hopelessness are common concerns of individuals with CKD. The treatment regimen demands may be overwhelming for a debilitated patient and further reduce the role functioning within the family. Also severe fluid and dietary restrictions further increase discomfort and frustration with the disease.34

Curtin, Bultman, Thomas-Hawkins, Walters and Schatell conducted a study with 307 people undergoing haemodialysis from 14 Gambro hospitals in US. Patients were given a list of 47 symptoms and asked to report how often they had each one.
The symptoms were generated based on a review of literature and analysis of more than 100 transcripts of dialysis and patient interviews conducted by Life Options Group over three years. The most commonly experienced symptoms were lack of energy 248 (90.5%), feeling tired 244 (90.7%), dry mouth/thirst 221 (77.0%), itchy skin 216 (73.2%), muscle cramps 192 (69.3%), numbness 177 (62.3%), change in weight 171 (61.7%), constipation 161 (57.1%), waking in the night 161 (56.4%), trouble falling sleep 160 (56.5%) not enough sleep 159 (55.4%), food cravings 150 (53.8%), restless legs 150 (52.1%), muscle weakness 148 (54.2%), lack of appetite 148 (52.7%), trouble staying awake 148 (52.7%), muscle soreness 146 (51.8%), lack of interest in sex 141 (51.1%), bone/joint pain 130 (46.1%), changes in skin 118 (41.7%), difficulty/sexual arousal 115 (43.9%), inability to enjoy sex 111 (42.0%). All most all of those symptoms were negatively correlated with their quality of life in terms of low Physical Component Summary (PCS) score and Mental Component Summary (MCS) scores in SF-36 scale.35

Devi interviewed 50 dialysis patients from Kasturba Hospital at Udupi District, Karnataka and identified a list of 27 problems which were commonly experienced by them. Majority of the patients (94%) experienced weakness after haemodialysis, 92% had worries about the possible complications and 88% had fear about being not able to work as before. Sleep disturbance was experienced by 78% of patients, 74% of them felt frustrated with their dependency. Most of them felt lack of interest in living (68%), easily annoyed (68%) and felt rejected because of the physical limitations (66%). Sixty six percent of the patients experienced fever after haemodialysis, 64% were frustrated about the treatment, 62% had thudding of heart and had difficulty complying with dietary restrictions. Other problems identified
among this group were blurring of vision (60%), pain at fistula site (56%), desertion from family and friends (54%), constipation (26%) and diarrhea (24%).

A2. Psychological impact of haemodialysis

Kimmel, Thamer, Richard and Ray examined the prevalence of psychiatric illness among hospitalized CKD patients. The risk of hospitalization with a diagnosis of a psychiatric disorder among CKD patients was compared with other chronic illness such as diabetes mellitus, ischemic heart disease, cerebrovascular disease, and peptic ulcer disease. The findings indicated that almost nine percent of all dialysis patients were hospitalized with a mental disorder. Hospitalization with psychiatric disorders was 1.5 to 3.0 times higher for renal failure patients compared with other chronically ill patients.

Cukor, Coplan, Brown, Friedman, Newville, Safier et al evaluated the psychosocial impact of anxiety disorders on patients with chronic renal failure in 70 randomly selected people undergoing haemodialysis at a single center in Brooklyn, New York, in the year 2008. The findings showed that 71% of the sample had an anxiety disorder. The presence of an anxiety disorder was associated with perceived lower quality of life ($t = 2.4; p < 0.05$). Early identification and comprehensive management of comorbid psychiatric conditions play a very crucial role in patient outcome.

Taskapan, Ates, Kaya, Emul, Kaya, Taskapan, et al found that in people undergoing haemodialysis with depression or a somatoform disorder, the interdialytic weight was significantly higher than those of the patients without these disorders ($p <$
0.05). All dimensions of quality of life decreased in people diagnosed with a psychiatric disorder. The authors concluded that depressive symptoms are important contributory factors for patients’ large interdialytic weight gain and psychiatric disorders that affect a patients' overall quality of life. Psychiatric assessment should be made part of haemodialysis treatment.\textsuperscript{19}

A cross sectional survey of the researcher among 25 CKD patients undergoing dialysis in Kasturba Hospital, Karnataka using Hospital Anxiety and Depression Scale (HADS) revealed that majority of them experience anxiety (64\%) and depression (76\%). The rates are much higher compared to western literature that could be due to the added burden of finances and lack of Medicare facilities. Additional observations of the researcher showed that they were exhausted with the huge burden of illness, withdrawn and fatigued to initiate a conversation, rest majority hopeless and helpless fighting with their illness related symptoms and hence unwilling to take part in survey where they do not have any benefit. Most of them travel far distance to reach hospital sacrificing their work and comfort, wait long hours to get the slot for dialysis.\textsuperscript{37}

A phenomenological study on the lived experience of people undergoing haemodialysis with their illness was conducted by the researcher at Kasturba Hospital, Karnataka. Data saturation was achieved by 18 subjects whose age ranged from 30 to 60 years. The ten themes derived at the end of the study were loss of hope, physical limitations, restriction, financial burden, lack of support, feelings towards the machine, search for hope and betterment, spirituality, marital relationship and uncertainty and fear about tomorrow. The detailed explorations of patients’ experience gave the evidence that the patients are affected in most of their life areas.
and they are in need of tailor made sound psychological intervention that can help them to adapt with demands and restrictions of CKD and dialysis.9

**Part B: Treatment adherence and outcome**

People undergoing haemodialysis are asked to comply to a very difficult treatment regimen consisting of, fluid and diet restrictions, plenty daily medications and four to five hours of haemodialysis sessions two to three times a week. Many people undergoing haemodialysis fail to adhere to their prescribed treatment. Although this regimen is important to maintain, many fail due to poor social support, personality traits, depression or anxiety. Thus it becomes a complex cyclical process leading to poor quality of life and deteriorated health. The psychological problems cannot be resolved with psychopharmacologic agents since it could be taxing for the kidneys to take the further load of medications.

CKD can be treated by renal replacement therapies, such as haemodialysis, transplantation and peritoneal dialysis. Haemodialysis is the therapy used most commonly. Among patients with CKD, 66 percent in the United States and 46 to 98 percent in Europe receive haemodialysis.38,39 When haemodialysis effectively contributes to long-term survival, morbidity and mortality of dialysis patients remains high, especially morbidity and mortality due to cardiovascular diseases.40 Only 32 to 33 percent of patients on haemodialysis survive till the fifth year of treatment, whereas 70 percent of patients who have kidney transplants live even after five years.41
Levenson, Glocheski identified that the end-stage renal disease accompanying treatment with the use of dialyses have many psychological and social factors. The first one is mood reduction and resignation attitude. The symptoms that usually occur in depression gain special significance in patients treated with dialyses. Loss of appetite in these patients may lead to a quick occurrence of metabolic disorders and the lack of motivation and reduction of strength may contribute to negligence of observing the doctor's advice.\textsuperscript{42}

A meta-analysis conducted by Dimatteo, Lepper and Croghan on patient adherence catalogued on MEDLINE and PsychLit from January 1, 1968, through March 31, 1998, found that the associations between anxiety and noncompliance were changing. The relationship between depression and noncompliance was substantial and significant, with an odds ratio of 3.03 (95% confidence interval, 1.96-4.89). The odds were three times higher than that of depressed patients will be noncompliant with medical treatment recommendations as compared with the non-depressed clients.\textsuperscript{43}

Many studies have established empirical evidence on noncompliance, depression and poor quality of life as the predictors for morbidity and mortality of people undergoing haemodialysis.\textsuperscript{44,45,46,47} The patients experience a sense of loss. Loss may be understood as a trauma connected with being deprived of a considerable external or internal value. There are a lot of such elements contributing to the experience among people treated with repeated dialyses; losses refer to professional and social position. The reduced financial status is a very significant problem which often leads to further losses: the necessity to change the lifestyle or habits, or
resignation from hobbies. Losses concerning the person’s concept of self as well as changes in self-confidence also are equally important.\textsuperscript{48}

Adherence with the prescribed medical regime is an important factor for achieving good therapeutic outcome in people undergoing dialysis and contributes to better results by reducing morbidity and mortality and the side effects of haemodialysis (eg, muscle cramping, malnutrition, sepsis, infection).\textsuperscript{49} Non-adherence with fluid restrictions leads to shortness of breath, muscle cramping, dizziness, panic anxiety, lung edema, and hypertension. Hypertension is a known risk factor for cardiovascular disease, it is also the most crucial cause of mortality in patients receiving haemodialysis.\textsuperscript{50,51}

Non-adherence with the dietary and medication regimens can lead to chronically elevated serum levels of phosphate, which play a crucial role in the development of secondary hyperparathyroidism and renal osteodystrophy.\textsuperscript{52} Increased levels of phosphate predispose even young person to coronary artery disease,\textsuperscript{53} resulting in significantly increased mortality risk.\textsuperscript{54,55} Skipping at least one dialysis in a month has been associated with a 25 to 30 percent elevated risk for death. Shortening dialysis often for more than 10 minutes (≥3 times per month) also has been associated with 11% of higher relative risk for mortality.\textsuperscript{54,56}

**Part C: Interventions for the people undergoing haemodialysis**

As the CKD population grows, it becomes highly significant to reduce costs of care. Patients are very happy with cost saving associated with reduced hospital admissions. Increased adherence to prescribed therapeutic regimen brings down
number and duration of hospitalizations. While patients must decide their own level of adherence, nurses must strive to help them achieve better health outcome. This can be done by providing patients with knowledge and encouragement so that they can make better choices.\textsuperscript{57,58} Earlier studies have proved that dialysis patients and their care givers lack knowledge on illness management and that their knowledge could be improved by educating them.\textsuperscript{59} Researches also gave evidences that improvement in the knowledge alone did not bring positive change in their compliance to the therapeutic regimen.\textsuperscript{60,61} Education, reinforcement interventions, shared decision making and follow-up responsibility can empower people to become responsible with their treatment regimen management.\textsuperscript{62,63}

**C1. Psychosocial interventions to reduce anxiety and depression**

Morgan’s review on methods to improve adherence of people undergoing haemodialysis to treatment regimens for a decade (1989 to 1999), identified various methods like behavioural, educational and nursing models. Behavioural approaches included monetary incentive, single or multiple counseling sessions, prizes and self-responsibility for weight calculation and weight gain. Educational approaches consisted of single individual teaching and provision of hand out. Nursing interventions tested on primary nursing and stringent compliance definitions. The results drawn out of these studies were non-conclusive and indicated individual approaches enhance adherence better.\textsuperscript{13}

Matusiewicz, Green and Kozowska conducted a RCT among 62 CKD patients who were assigned to experimental or control groups. Participants in the experimental group listened to a CD with a psychological intervention twice a day during three
weeks. The instruments used were the Cognitive Appraisal Inventory and the State-Trait Anxiety Inventory. The experimental group had a lower level of anxiety \([t(30) = 2.99; p < 0.05]\), a weaker intensity of cognitive appraisal of the treatment situation as a threat \([t(30)=3.48; p < 0.05]\), a weaker intensity of cognitive appraisal of the situation as a harm/loss \([t(30)=2.75; p < 0.05]\) and a stronger intensity of cognitive appraisal of the situation as a challenge \([t(30) = 3.49; p < 0.05]\) after the application of a psychological intervention. The applied psychological intervention influenced the patients' psychological state in a desirable way. The researchers concluded that such positive changes may indirectly contribute to enhance social networking and satisfaction with the activities.\(^{64}\)

A quasi-experimental study was carried out to determine the effects of Continuous Care Model on stress (CCM), anxiety and depression in patients on haemodialysis in Hamedan, Iran in 2005 by Rahimi, Ahmadi and Gholyaf. Thirty eight patients on haemodialysis participated in the study on the basis of a random-figure table. The CCM consisted of four stages: orientation, sensitization, control, and evaluation. The data was collected using Depression Anxiety Stress Scale (DASS-21). The sample consisted of 47.2 percent men, 52.8 percent women, 13.9 percent single and 83.3 percent married, with 41.7 percent in the age range of 40 to 59, 19.4 percent in the range of 20 to 39, and 33.3 percent in range of 60 or older. Results revealed a significant relationship between applying the CCM and levels of patient stress \((p = 0.001)\). There was also a significant relationship between applying the CCM and levels of patient anxiety \((p = 0.001)\). There was a significant relationship between applying the CCM and levels of depression \((p = 0.001)\).\(^{65}\)
Yurtkurana, Alpa, Yurtkuranb and Dilekb evaluated the effects of a yoga-based exercise program on pain, fatigue, sleep disturbance and biochemical markers in the people undergoing haemodialysis in Iran, through a randomized controlled trial in the year 2005. Clinically stable people undergoing haemodialysis (n = 37) were included and followed in two groups: the modified yoga-based exercise group (n = 19) and the control group (n = 18). Yoga-based exercises were done in groups for 30 min/day twice a week for 3 months. All of the patients in the yoga and control groups were given an active range of motion exercises to be practiced for ten minutes at home. The main outcome measures were pain intensity (measured by the visual analogue scale, VAS), fatigue (VAS), sleep disturbance (VAS), and grip strength (mm of Hg). Biochemical variables such as urea, creatinine, calcium, alkaline phosphatase, phosphorus, cholesterol, HDL cholesterol, triglyceride, erythrocyte, and haematocrit also were monitored. After 12 weeks of intervention, significant improvements were seen in the variables: pain −37%, fatigue −55%, sleep disturbance −25%, grip strength +15%, urea −29%, creatinine −14%, alkaline phosphatase −15%, cholesterol −15%, erythrocyte +11%, and haematocrit count +13%. Improvement of the variables in the yoga-based exercise program was found to be superior to that in the control group for all the variables except calcium, phosphorus, HDL-cholesterol and triglyceride levels.66

A RCT was conducted by Tsay and Hung among ESRD patients with the purpose to investigate the effect of an empowerment programme on empowerment level, self-care, self-efficacy and depression. Selected patients of two dialysis centers in southern Taiwan were randomly assigned into empowerment group (n=25) and control group (n=25). The empowerment program included identification of problem
areas for self-management; exploration of emotions associated with these problems; development of a set of goals and strategies to overcome these problems to achieve these goals; creation and implementation of behavioural change plans and stress management. The outcomes measures were obtained by Empowerment Scale, Strategies Used by People to Promote Health and Beck Depression Inventory. Data were collected at baseline and six weeks following intervention. Statistical tests used were t-test and analysis of covariance. The results indicated that scores of the empowerment [t (48) =6.54, p<0.001], self-care self-efficacy [F(1,47)=10.82, p=0.002)] and depression [t(48)=2.49, p=0.03] in the empowerment group with a marked improvement than the control group.67

Rabindranath, Daly, Butler, Roderick, Wallace and Macleod carried out a systematic review to assess the effectiveness of psychosocial interventions in the treatment of depression for people undergo maintenance dialysis. The search strategy employed was comprehensive including MEDLINE, EMBASE, PsychINFO and the Cochrane Library. All RCTs relevant to the treatment of depression in dialysis patients were identified by reference lists and contacting potential authors of studies. The criteria for selection of RCTs were, the one comparing any psychosocial intervention with control intervention or no intervention in depressed dialysis patients. Data were to be summarized by two investigators independently onto a standard form and then entered into Review Manager 4.2. Relative risk (RR) for dichotomous data and a mean difference for continuous data were to be calculated with 95% confidence intervals. Despite extensive search, no RCTs were identified highlighting the need for undertaking adequately powered RCTs to address psychosocial interventions for depression in dialysis patients.68
C2. Psycho social interventions to improve quality of life

Lii, Tsay and Wang investigated the effects of group intervention on depression, self-efficacy and quality of life among haemodialysis patients through an experimental design. Patients were selected at two haemodialysis units in northern Taiwan. Out of 60 randomly assigned into experimental or control groups, 48 completed the study. Twenty patients in the experimental group received group psychosocial intervention for two hours per week for two months. Twenty eight patients in the comparison group received routine unit care with a self-care booklet. Strategies Used by People to Promote Health, Beck Depression Inventory and the Short Form-36 were the instruments used for data collection at pre-test and a month following the therapy. The results showed that self-care, self-efficacy, depression and quality of life significantly improved for patients in the experimental group, compared with the comparison group. The study indicated that group psychosocial intervention significantly reduced depression, improved self-care self-efficacy and quality of life in haemodialysis patients. Researchers concluded that such interventions are clinically suitable for haemodialysis patients as they did not use expensive resources and was not time intensive, making that a viable therapy.69

Sixty two adults, approved for kidney transplantation were randomized to quality of life therapy (QOLT), supportive therapy (ST) or standard care (SC) by Rodrigue, Mandelbrot and Pavlakis at one centre in USA. The samples were repeatedly assessed for the quality of life, psychological distress and social intimacy at pre-intervention, one week post-intervention and 12 weeks follow-up. Quality of Life Inventory, SF-36 Health Survey, Profile of Mood States-Short Form (POMS),
Hopkins Symptom Checklist-25 and Miller Social Intimacy Scale were used for data collection. Active treatments were conducted once weekly, face-to-face, for 50 minutes per session, with participants receiving eight individual treatment sessions over a period of two months. There was a significant group effect on post-intervention QOLI ($F = 10.6$, $p < 0.001$, $\eta^2_p = 0.27$), POMS ($F = 4.3$, $p = 0.02$, $\eta^2_p = 0.13$) and HSCL ($F = 4.5$, $p = 0.02$, $\eta^2_p = 0.14$) scores, and number of mentally unhealthy days ($F = 4.3$, $p = 0.02$, $\eta^2_p = 0.13$). The QOLT group had higher QOLI scores than the ST (Cohen’s $d = 0.71$ and $d = 0.47$, respectively) and SC ($d = 0.64$ and $d = 0.65$, respectively) groups and 12 weeks follow-up, and a higher social intimacy scores compared with SC patients at 12 weeks follow-up. Both QOLT and ST patients had lower psychological distress scores compared with SC patients at one week post-test, although only QOLT continued to show reductions in psychological distress scores. The results showed that quality of life, psychological functioning and social intimacy with QOLT can be improved while patients wait for kidney transplantation.\textsuperscript{70}

Stanley, Leither and Sindelir tested the benefits of holistic breathing exercise in nine haemodialysis units of Minnesota. KDQOL was used to collect data. A holistic technique emphasizing simple, long-exhalation breathing was taught to 126 patients. A follow-up was done for 94 patients (37 male, 57 female; average age 69) at six to eight weeks after initial training. Higher retention rates for continued practice were seen in units where patients were encouraged to use breathing technique by the staff. Of the 94 respondents, 52% continued using the breathing technique, stating improvement in relaxation (53%), energy levels (27%), sleep (12%), or pain (8%) while using the breathing technique. The major reasons for stopping the technique cited by the 48% who stopped were; lack of interest (47%) or lack of perceived
benefit (26%) and inability to remember (27%). Among those who had difficulty remembering, many stated the breathing technique helped them to remember. More number of women continued use of the breathing technique than men.\textsuperscript{71}

A randomized controlled trial was conducted by Moattari, Ebrahimi, Sharifi, and Rouzbeh at Boo Ali Sina Dialysis Center, Iran. Forty eight haemodialysis patients participated in the study who were randomly allocated into control and experimental groups after acquisition of informed consent. A demographic data form and two questionnaires for self-efficacy and quality of life were used to collect the data. Blood pressure and interdialytic weight gain were measured and laboratory data were taken from patients’ charts. Empowerment intervention for six weeks that included four individual and two group counselling sessions was performed for the experimental group. Post-test data were obtained six weeks after intervention and the data were analysed by ANCOVA using SPSS 11.5. Results showed there was a significant difference between the experimental and control groups in terms of pre-to post-intervention changes in overall self-efficacy scores (p <0.001), stress reduction (p <0.02), decision making (p <0.001), in addition to overall quality of life (p <0.001) and all dimensions included within quality of life. The post-intervention systolic blood pressure (p <0.001), diastolic blood pressure (p <0.003), interdialytic weight gain (p <0.039), haemoglobin (p <0.003) and haematocrit (p <0.004) levels also significantly differed between the groups. The researchers concluded that combination of individual and group empowerment counselling sessions improves self-efficacy, quality of life, clinical signs, haemoglobin and haematocrit levels. Haemodialysis centres should consider empowering haemodialysis patients.\textsuperscript{72}
C3. Psycho social interventions for improving adherence

Tanner, Craig, Bartolucci, Allon, Geiger and Wilson assessed the effectiveness of a self-monitoring tool on perceptions of self-efficacy, health beliefs, and adherence in people undergoing haemodialysis of a 43 chair ambulatory dialysis center in Birmingham. The subjects included 40 patients with CKD (25 men and 15 women, age 26 to 78 years), on haemodialysis for at least two months and with a history of non-adherence of phosphorus and/or fluid restrictions for one or more months. They were randomly allocated to the experimental and control groups, assessed for health beliefs, perceptions of self-efficacy for performing specific healthful behaviors, renal diet knowledge at baseline, before intervention and six months later. The treatment group received training in self-monitoring. The results showed that there were no significant improvements in adherence with phosphorus and fluid restrictions between the two groups, although a comparison within the groups revealed the treatment group had a statistically significant decrease in mean phosphorus levels of 7.14 to 6.22 mg/dL (p = 0.005) from the baseline to three months. No significant differences existed between the two groups for health beliefs and perceptions of self-efficacy. Knowledge scores in the treatment group improved significantly when compared to the control group (p = 0.008) and was a significant increase from baseline (p = 0.002). In the control group, all scores fell slightly but this difference was not statistically significant. The researchers recommended further researches using repeated measures design to explore the effects of increased frequency and duration of an intervention on the attainment of patient clinical outcome measures.73
Ghaddar, Shamsuddeen and Elzein assessed people undergoing haemodialysis’ readiness to comply with recommended fluid intake as it relates to their perceptions of therapy and disease in three hospital-based haemodialysis centers in Lebanon. The study used the health belief model (HBM) and the trans-theoretical model (TTM). Sample included 172 people undergoing haemodialysis who had been on dialysis for at least three months and were mentally stable. Patients were placed into TTM stages based on their readiness to comply with recommended fluid intake (as confirmed by four week IDWG measures) and their perceptions toward therapy (based on HBM constructs). The study included 54.1 percent males, average age of sample was $57.8 \pm 14.0$ (SD) years and average number of years on dialysis was $4.6 \pm 4.9$. Regarding stages, 18.5 percent of participants were placed in pre contemplation, 40.0% in contemplation, 38.1% in preparation and 3.4 percent were in the action/maintenance stages. The HBM constructs were associated significantly with TTM ($p< 0.01$). Perceptions of benefits ($p = 0.04$) and self-efficacy ($p < 0.01$) were significantly associated with TTM. Compliance is a multifaceted topic that is crucial for the survival and quality of life of people undergoing haemodialysis. A higher understanding of patients' beliefs and level of self-efficacy is an essential key for enhancing patients' adherence to therapy.

Welch and Hawkins reviewed psycho-educational intervention studies that were designed to reduce IDWG in the adults undergoing haemodialysis with the purpose of critiquing research methods, describing the effectiveness of tested interventions and making recommendations for future research. The empirical works in Medline, PsychInfo and CINAHL databases were searched. Sample, design, theoretical framework, intervention delivery and outcome of each study were
evaluated. In the nine studies obtained, self-monitoring appeared to be a promising strategy to be considered to reduce IDWG. Theory was not uncommonly used to guide interventions, designs generally had control groups and the interventions were delivered individually. More than one intervention was delivered at a time, though the duration of the intervention varied markedly, there was only short-term follow-up. Although IDWG was the only outcome, it was operationalized in different ways. Researchers concluded that, theoretical models and methodological rigor are needed to guide future research. Specific recommendations on design, measurement and conceptual issues were given to enhance the effectiveness of future research.\textsuperscript{75}

A quasi experimental study was conducted by Barnett, Li Yoong, Pinikahana and Si-Yen in order to check the effect of a patient education programme on fluid compliance as assessed by IDWG, mean pre-dialysis blood pressure and rate of fluid adherence. The study was conducted in a dialysis center located in a teaching hospital of Kuala Lumpur, Malaysia. Twenty six patients with an IDWG of greater than 2.5 kg were identified as non-adherent were recruited to the study. The intervention that included teaching and weekly reinforcement about diet, fluids and control of weight gain was carried out over a two months period. Patients' mean IDWG decreased following the educational intervention from 2.64 kg to 2.21 kg ($P < 0.05$) and adherence to fluid restrictions increased from 47\% to 71\% following the intervention. Pre-dialysis mean blood pressure did not improve statistically following the intervention, though the maximum recording for pre-dialysis systolic pressure lowered from 220 mm of Hg to 161 mm of Hg. There were no significant associations between IDWG and age, educational level, marital status or employment status. Women showed a greater decrease in mean interdialytic weight gain than men. The
Chapter II

Review of Literature

Researchers concluded that the nephrology nurses have longstanding relationship with their patients and in a perfect position to provide ongoing education and encouragement, especially for those experiencing fluid adherence difficulties and dietary restrictions.76

A randomized controlled study by Tsay, examined the effectiveness of self-efficacy training on fluid intake compliance in northern Taiwan. Sixty two eligible ESRD patients with age between 20 to 65; receiving routine haemodialysis and living in a community setting participated in the study. The experimental group (n = 31) received 12 sessions of structured self-efficacy training while the control group patients (n = 31) received only routine care. The basis of intervention was Bandura’s theory. The intervention contained an educational component, performance mastery, experience sharing and stress management. Data were collected at baseline and intervals of one, three and six months following the intervention. Results indicated that mean weight gains of the experimental group decreased gradually following self-efficacy training. The findings were not statistically significant (Wilks’ Lambda= 0.98, F =0.364, p > 0.05; Wilks’ Lambda= 0.97, F =0.67, p > 0.05), indicating that the effect of the intervention was not related to time or maturation factor. The group main effect was significant between groups, F (1, 56) 8.10, p=0.006.77

C4. Cognitive behaviour therapy to reduce anxiety, depression and improve quality of life

Duarte, Miyazaki, Blay and Sesso, assessed the effectiveness of CBT in people undergoing haemodialysis diagnosed with major depression through a RCT
conducted in Brazil. Intervention group of 41 patients was given twelve weekly sessions of CBT over three months while the control group of 44 patients received usual treatment offered in the dialysis unit. Beck Depression Inventory, MINI and KDQOL-Short Form questionnaires were administered for both the groups at baseline, after three months of intervention or usual treatment and after nine months of follow-up. BDI scores decreased from baseline in both groups to 10.8 ± 8.8 in the treatment group versus 17.6 ± 11.2 in the control group (p<0.002) at nine months. The experimental group had significant improvements in the average scores of MINI and in quality of life dimensions that included the burden of renal disease, sleep, quality of social interaction, overall health and the mental component summary, when compared to the control group. The researchers concluded that CBT is an effective treatment of depression in people undergoing haemodialysis.78

Weiner, Kutner, Bowles and Johnstone reported in their study held at 22 dialysis units in Louisiana to enhance psychosocial health following Hurricanes Katrina and Rita. Twenty two social workers implemented a cognitive behavioural intervention for 69 patients. The outcome in terms of psychosocial status domains (general health status, social functioning, burden of kidney disease, depressed mood, anxiety, and mastery) were measured through questionnaires. Following the intervention, participants rated their general health status (p < 0.05) and social functioning (p<0.05) significantly higher than the baseline. Those who listened to the class on managing stress through communication and problem solving and discussed it with social worker, had significant improvement in depressed mood score (p <0.05) after completing the program, compared to others.79
An experimental study aimed to investigate the effect of cognitive behavioural training on depression in People undergoing haemodialysis of selected hospitals in Mashhad was carried out by Marvi, Bayazi, Rahmani and Deloei. Four hospitals were selected through cluster sampling from the total 12 hospitals in Mashhad. Forty people undergoing haemodialysis (17 women and 23 men) were selected randomly from those four hospitals and they were randomly allocated into experimental and control group of 20 each. After the initial interview with Beck Depression Inventory (BDI), the experimental group was given with 12 sessions of cognitive behavioural training. The sessions were conducted twice a week for duration of about an hour per session. Cognitive and behavioural problems and negative thoughts were discussed with the participants during the sessions. Then the participants were told about applicable methods of treatment. Homework was given at the end of each session. Results indicated that the experimental group had significant reduction in their depression scores in the post test, \( t=8.678 \) \((p<0.001)\). The researchers concluded that cognitive group behaviour therapy is effective for a decrease in the depression among people undergoing haemodialysis in the light of earlier studies.\(^8\)

The downstate Medical Center of central Brooklyn in New York had piloted many models for the delivery of cognitive behavioural intervention including appointments at the outpatient psychology service, meetings at the dialysis center on non-dialysis days, appointments before or after the patients' treatments and, finally, meetings during dialysis, as reported by Cukor. Sixteen ESRD patients who had major depression were treated individually with a 15 week CBT that focused on the techniques of challenging distorted thoughts and encouraging behavioural activation.
All patients showed a significant decrease in their BDI-II scores at the conclusion of treatment (Possible scores on the BDI-II range from 0 to 63, with higher scores representing more depression). At the end of the therapy, average BDI-II score fell from 28.9 to 18.5 and to 18.8 at a three month follow-up, indicating both a significant and sustained reduction in depressive affect. The researcher concluded that ESRD patients have a great need for psychiatric services and are often neglected. Individual treatment that is conducted by consulting therapists at chair-side of the haemodialysis center is a novel method of psychotherapeutic intervention that alleviates many of the obstacles of traditional referral-based outpatient services. CBT assurances to be a better treatment choice for treating depression of people undergoing haemodialysis.81

Cukor, et al carried out a randomized crossover trial on effect of individual CBT that was administered chair side during dialysis treatments for three months to the intervention group and participants were assessed at three and six months following the intervention. Sixty five participants were selected from two dialysis centers in New York in which 59 were assigned to the treatment first group (n=33) and the wait list control group (n=26). The treatment first group gained significantly larger reductions in BDI II (self-reported, p=0.03) and Hamilton Depression Rating Scale (clinician-reported, p<0.001) scores after intervention compared with the wait list group. Mean scores for the treatment-first group did not change significantly at the three month follow up. Eighty nine percent of the participants who were diagnosed with depression at baseline in the treatment-first group were not depressed at the end of treatment compared with 38% in the wait-list group (F, p=0.01). Researchers also found that the treatment first group experienced greater improvements in quality of life, assessed with the KDQOL Short Form (p=0.04), and IDWG (p=0.002) than the
wait-list group, although no effect on compliance was evident at follow-up. The authors concluded that, CBT is effective in bringing significant improvements in depression, quality of life, and prescription compliance and recommended further studies to assess the long-term effects of CBT on morbidity and mortality in patients with ESRD. \(^{82}\)

An evaluative study with one group pre-test post-test design on the effect of cognitive behaviour therapy on depression among maintenance haemodialysis patients attending the dialysis unit of Medical College Hospital, Kottayam was conducted by Sivadas. By purposive sampling 30 patients who had a score of 14-28 in BDI were selected for the intervention. The tools used were socio-demographic data sheet and Beck Depression Inventory. CBT had six sessions one per week for six weeks that included activities such as positive imagination, relaxation exercises and cognitive restructuring. Pre-test was given on the first day while selecting subjects for study and post-test was given in the sixth week after cognitive behaviour therapy. The results showed that 73.3% had moderate depression and 26.7% had mild depression before CBT and 76.9% had mild depression and 23.1% had moderate depression after CBT. Paired t test showed there was a statistically significant difference between the pre and post-test mean depression scores (p<0.001). One way ANOVA revealed there was no significant association between depression among patients on maintenance haemodialysis and majority of selected demographic variables such as age, education, occupation, family income, primary care giver, marital status, duration of dialysis and number of dialysis per week. The finding of the study encourages the practice of CBT in similar situations. \(^{83}\)
C5. Cognitive behaviour therapy for improving adherence

Matteson and Russell systematically reviewed randomized-controlled trials designed to increase treatment, medication, fluid and diet adherence in adult people undergoing haemodialysis. A search of CINAHL, MEDLINE, PsychINFO and all Evidence Based Medicine (EBM) Reviews (Cochrane DSR, ACP Journal Club, DARE and CCTR) was conducted in order to find RCTs that tested the effect of interventions to improve adherence in adults undergoing haemodialysis. Eight randomized-controlled trials met inclusion criteria and out of them, six had brought statistically significant improvement in adherence after the intervention. Surprisingly all the six intervention studies had a cognitive component, with three studies utilizing cognitive or behavioural intervention techniques.84

A RCT on group cognitive behavioural intervention aimed at improving fluid adherence in patients receiving haemodialysis was tested by Sharp, Wild, Gumley and Deighan at Glasgow in UK. Fifty six subjects receiving haemodialysis from four renal outpatient settings were randomly assigned to an immediate treatment group (ITG) (n = 29) or deferred treatment group (DTG) (n = 27). Participants were assessed at baseline, post-intervention, and follow-up stages. A four week intervention using educational, cognitive and behavioural strategies to enhance effective self-management of fluid intake was given to the ITG. No significant difference in mean IDWGs was found between the two groups during the acute-phase analysis [F(1,54) = 0.03; p > 0.05]. Although in longitudinal analysis, there was a significant main effect for mean IDWG [F(1.76,96.80) = 9.10; p < 0.001] and a significant difference between baseline and follow-up IDWG values (t55 = 3.85; p< 0.001), indicating
improved adherence over time. No adverse effects of treatment were indicated through measures of psychosocial functioning. Some significant changes were evidenced in cognitions thought to be important in mediating behavioural change. Study provided evidence for the feasibility and effectiveness of applying group-based cognitive behavior therapy to enhance adherence to haemodialysis fluid restrictions.\textsuperscript{23}

Sagawa, Oka and Chaboyer carried out a quasi-experiment in haemodialysis units of two hospitals in Japan. The aim of the study was to assess the efficacy of CBT on chronic haemodialysis patients’ ability to achieve fluid consumption related behavioural objectives. The study included a four week base line phase, a six week intervention phase and a four week follow up phase. Intervention consisted of self-contract, reinforcement and self-monitoring techniques. Participants were enrolled if they had a larger than desired weight gain between dialysis sessions and a urine volume less than 500 ml per day. Patients were excluded if they had a psychiatric disorder, were cognitively impaired as evidenced by a mini-mental state examination (MMSE) of less than 21, or had a poor knowledge of haemodialysis treatment. Ten out of total 14 patients completed the study. The average age of the participants was 47.8±11.4 years, they had been on haemodialysis for an average of 8.5±5.2 years and their average MMSE was 29.5±0.8. The fluid intake objective was achieved 65 percent in the intervention phase. Fifty percent of participants achieved their objectives at least 3/4 of the time without individualised reinforcement. Researchers concluded that CBT is effective in enhancing patients change their fluid intake behaviours.\textsuperscript{85}
Hegel, Ayllon, Thiel and Oulton compared cognitive intervention and behavioural intervention to determine their relative effectiveness in reducing IDWG among eight adult male people undergoing haemodialysis at Lebanon. The behavioural model involved positive reinforcement, shaping and self-monitoring. The cognitive therapy included counseling intervention designed to modify health beliefs. The results showed that behavioural intervention was superior to the cognitive intervention in producing maintenance of reduced weight gain. Combining the interventions did not result improvement over the behavioural intervention alone. Maintenance of self-monitoring procedures produced continuation of improvements up to two months post treatment. Repeated-measures ANOVA indicated changes for only the ‘barriers’ dimension of the health belief model (p < 0.001) and it happened only following or concurrent with adherence behavior change.86

A nurse delivered haemodialysis patient education programme incorporating CBT was developed by Nozaki, Oka and Chaboyer. The effects of the CBT were compared with those of a standard patient education (SPE) programme on patients’ salt intake and weight gain using a quasi-experimental design. CBT and SPE groups had 11 participants each, who were undergoing haemodialysis therapy at an outpatient clinic in Japan. Both CBT and SPE groups demonstrated reduction in the daily weight gain rates in the intervention period compared with the baseline period at p=0.041 and p=0.045 respectively. The effect in CBT group lasted for 12 weeks but for only eight weeks in the SPE group. In addition, daily salt intake decreased in the intervention period compared with the baseline period in both the CBT (p=0.006) and SPE (p=0.013) groups, persisting for 12 weeks. The authors concluded both programmes as effective and CBT having longer effect over SPE.87
Anson, Byrd and Koch reported the implementation of CBT on a 60 years old, married Caucasian male who was college professor by profession. He had been undergoing three weekly haemodialysis for four years and also had type II diabetes, CKD and congestive heart failure. His chronic non-adherence to fluid restrictions resulted in fluid overload and subsequent deactivation of nomination to kidney transplantation. The intervention consisted of 11 sessions of individual psychotherapy with various strategies including increasing awareness, decreasing motivation, increasing effort, engaging in competing events, conducting thought stopping, breaking repetitive routines, eliciting social support and reinforcement. He was able to reduce his fluid consumption from 90 to 150 ounces of fluid to less than 60 ounces per day by the closure of treatment. Throughout the course of treatment, a downward trend of relapse frequency and total amount of liquids ingested on those relapse days were noted. Results depicted that the patient successfully restricted his fluid intake at or below recommended levels 83% of days after the end, owing to the success of the therapy.\(^8\)

A randomized controlled trial on fifteen fluid non-adherent peritoneal dialysis patients were carried out by Hare, Clark-Carter and Forshaw in UK. Subjects were randomly assigned to an intervention group or a control group. The study ran for a total of 21 weeks, with five data collection points; at baseline, post-intervention and at three follow-up points; providing a RCT phase and a combined longitudinal analysis phase. Educational, cognitive and behavioural components, aimed to assist patients’ self-management of fluid were the content the contents of the CBT group intervention. Results indicated two significant differences in reduced HADS anxiety (t\(_{14} = 2.32; \ p = 0.034\)) and increased SF-36 subscale for Social Function (t\(_{14} = 2.73; \ p = 0.013\)).
p = 0.016). No significant differences in weight (Kg) reduction in either phase and undesirable changes in blood pressure were observed. However, in the longitudinal phase, a statistically significant difference in oedematous status was observed at six week follow-up; which may be indicative of fluid adherence. Positive and significant differences were observed in the desired direction for measures of psychological well-being, quality of life and health beliefs.89

**Summary**

This chapter dealt with various studies that tested the effect of cognitive behavior therapy and other similar psychosocial interventions in reducing anxiety and depression and improving quality of life and adherence of people undergoing haemodialysis. The extensive review revealed that there were no controlled trials in this area carried out in India among the same population and also psychological intervention is highly recommended to haemodialysis patients. From the available literature, it is evident that cognitive behavior therapy is beneficial to the target population. The process of analyzing various scientific literatures gave new insights to the researcher with regard to the conduct of the present study.