COMMUNITY-BASED INTERVENTION (CBI) ON CLINICAL PARAMETERS TO SUSTAIN OPTIMAL HEALTH STATUS AMONG END-STAGE KIDNEY DISEASE PATIENTS UNDERGOING HAEMODIALYSIS – A REVIEW

Mr. Johnson Peter.*| Dr. Balasubramanian N.**

** Ph.D. Scholar, Himalayan University, Itanagar, Arunachal Pradesh, India.*

*** Professor cum Principal, Ambika College of Nursing, Mohali, Punjab, India.*

ABSTRACT:

The investigator has extensive experience in dialysis care in numerous national and international settings. He underwent review of literature to develop deeper insight into the community-based intervention on clinical parameters and sustain the optimal health status of the ESKD undergoing haemodialysis and advantage of information on problem and on what has been done before. It provides foundation for future investigation justified the need for replication, throws light on the feasibility of the study to another with a hope to set up a comprehensive body of scientific knowledge, from which legitimate and persistent theories may be developed. In this research, researcher focused on the published and unpublished scientific papers analyzing clinical parameters of ESKD sufferers. The facts will be 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.

Key Words: *Community based intervention**,** dialysis, end stage kidney disease (ESKD), ESKD patients undergoing haemodialysis.*

ABOUT AUTHORS:

Author Mr. Johnson Peter is a Ph.D. Scholar at Himalayan University in Itanagar, Arunachal Pradesh.

Author Dr. Balasubramanian N. is Professor cum Principal of Ambika College of Nursing in Mohali, Punjab. He is an active researcher with many publications in his name. He has attended and organised many national and international seminars, conferences and workshops. He is an eminent author and a dynamic personality with penchant for nursing and allied sciences. He is a member of Trained Nurses Association of India (New Delhi) and Indian Society of Psychiatric Nurses. He is a Gold medalist in M.Phil. (Nursing).

INTRODUCTION

Several techniques to enhance the limited exercise capacity of individuals with ESKD have been implemented, but for many such ESKD, these have been difficult to adopt and maintain. However, the investigator has extensive experience in dialysis care in numerous national and international settings. During his clinical experience identified that the ESKD undergoing dialysis are getting repetitive verbal instructions from the doctors and nurses. Therefore, maximum of the ESKD find it difficult to retain that information due to the complexity of the regimen. Hence the researcher found it important to develop and evaluate the community-based intervention with audiovisual aids among the ESKD undergoing dialysis. It might be a good source of reinforcement and constant reference. Thus, the ESKD who receive the intervention program will develop self-motivation to maintain good self-care and quality of life and helps to achieve optimal health status.

Therefore the above fact and studies created an insight in the investigator`s mind that the incidence of complications could be reduced by improving the knowledge of clinical parameters of ESKD undergoing dialysis. In addition, it may enhance the changes in the health care delivery system. The overall aim of the present study is to assess the effectiveness of the community-based intervention on clinical parameters and sustain the optimal health status of the ESKD undergoing haemodialysis.

Review of literature is a step in the improvement of a research project. It enables the investigator to develop deeper insight into the trouble and advantage of information on problem and on what has been done before. It provides foundation for future investigation justified the need for replication, throws light on the feasibility of the study to another with a hope to set up a comprehensive body of scientific knowledge, from which legitimate and persistent theories may be developed.

In this research, researcher focused on the published and unpublished scientific papers analyzing clinical parameters of ESKD sufferers. The facts will be 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 will be organized under three important parts:

- Literature associated to effectiveness of community based intervention on blood pressure among ESKD patients.
- Literature associated to effectiveness of community based intervention on BMI among ESKD patients.
- Literature associated to effectiveness of community based intervention on urea and creatinine among ESKD patients.
- Literature associated to effectiveness of community based intervention on magnesium among ESKD patients.
- Literature associated to effectiveness of community based intervention on life style modification among ESKD patients.

Effectiveness of community based intervention on blood pressure among ESKD patients.

In general, health fitness education is the basic tool to enhance the ESKD' information about disease and its treatment leading to better treatment adherence and ESKD used to take a positive function in their self-care management' [Shaw et al, 20]. However, it is unclear what fitness instructional approach works best in improving ESKD' knowledge on haemodialysis and possibly clinical outcomes in ESKD. There is now an increasing community-based effort in the prevention and control of ESKD in China.

George Thomas (2009) stated that aging is the most common risk factor for the development of high blood pressure and diabetes as well as chronic kidney disease. Nearly one billion people worldwide have high blood pressure and it is expected to increase to 1.56 billion by 2025. ESKD is a major chronic disease that is often managed at community health service centers in China. Health education may play a key role in the management of hypertensive ESKD The common tools of health education in community health centers in China include health posters, health booklets, individualized lecture, and public lecture **(Ling Y et al, 2004**).

Chen M & Wang, 2008 mentioned in a research alternatively need of the strategies for the primary care of ESKD seeks to lessen exposure to factors known to lead to kidney impairment. While community based intervention approach may provide a great opportunity to reduce the development of ESKD, community based health education or intervention related studies on the predicted effects of blood pressure (BP) reductions applied to the general population.

Landry D W and Oliver J A (2006) conducted in Greece to investigate the relationship between blood pressure and haemodialysis among 8 haemodialysis ESKD. Plasma potassium, blood pressure were measured at the beginning, completion and 30 minutes post haemodialysis. Statistical values suggested that mean blood pressure was significantly increased when comparing beginning (104.9±14.8), completion (102.7±16.0) and 30 minutes post haemodialysis (109.1±15.26.).The study recommended further educational Programme for the dialysis ESKD.

Demircioglo F et al, (2002), carried out a potential study amongst twenty ESKD in Turkey to discover the outcomess of dialysis modalities (continuous ambulatory peritoneal dialysis, haemodialysis) in coronary artery disease ESKD. Pre and post-analysis of ECG-Bolter monitoring and heart rate variability parameters were examined. When the dialysis modalities were compared, the time domain analysis parameter was significantly greater in CAPD groups (711-41/111+33) compared to those of haemodialysis group (68±25, 88±22) indicating that CAPD modality is causing cardiac autonomic dysfunction more than haemodialysis.

Clyne (2011) said that ESKD with chronic kidney disease have a markedly increased morbidity and mortality from cardiovascular disease and experience a progressive decrease in physical function. The causes of chronic kidney disease are insufficient blood-pressure control, secondary hyperparathyroidism, increased inflammatory activity and a sedentary lifestyle

Apple LJ (2013) conducted a study to evaluate the effectiveness of the video teaching programme on lifestyle modifications in controlling blood pressure among chronic kidney disease ESKD. A total of 60 chronic kidney diseases ESKD with hypertension were selected and quasi-experimental research design was utilized. The 20 education on lifestyle modifications included increased physical activity, reduced salt intake, decreased potassium and reduced fat and cholesterol intake and overall health pattern. The result reported that the video-assisted teaching programme on lifestyle modification was found to be effective in controlling blood pressure for chronic kidney disease ESKD.

A pre experimental study was conducted to assess the effectiveness of Self-instructional Module on knowledge and practices among caregivers concerning the self-care management of ESKD on hemodialysis. Totally 60 samples were selected by using non-probability purposive sampling technique. A pre-test was done through self-structured questionnaire and self-reported practices and self-instructional module was distributed and at the end, conducted a post test. The result of this study showed, 50% of the subjects had good knowledge, 45% of the subjects had average knowledge and 5% of the subjects had a poor score and 78.3% of the subjects had good practice, 21.7% of the subjects had average practice in the pre-test. Post test showed that the knowledge and practice improved to 100% (**Lydia et al., 2016)**.

An observational study was conducted to evaluate the quality of care on the vascular access site on ESKD undergoing hemodialysis in hemodialysis center at Isfahan's Al-Azhar Hospital, Iran. A total of 110 samples (63 men, 47 women) with end stage renal disease that undergo hemodialysis were selected for the study. Among them 72 ESKD had AV fistula access and 38 ESKD had subclavian catheter access. Checklist related to care of vascular access site was used to collect the data. Results showed that moderate level of care was identified in 56.9% of samples with AV fistula and optimal level of care identified in more than 60% of samples with central venous catheter and only 5 ESKD received the full score of quality care. Therefore a continuing nursing education is necessary to improve the care technique for ESKD with hemodialysis **(Mohsen et al., 2012).**

A cross sectional study was conducted to assess the relationship of salt intake in chronic hemodialysis ESKD with many factors as salt intake increases fluid intake and, consequently, blood pressure (BP) and inter-dialytic weight gain (IDWG). The researcher selected 109 ESKD undergoing hemodialysis from 5 dialysis centers. The data was collected by using Food Frequency Questionnaire (FFQ) from the participants. Salt intake was high (8.6 +5.4 g/day). In the whole group of ESKD education was the only variable that significantly correlated with both the total salt intake ($r = -0.29$; $p < 0.01$). Concerning the salt of the FFQ food items, there was a direct correlation with the %IDWG ($r = 0.26$; $p < 0.01$) and an inverse one with age ($r = -0.35$; $p < 0.001$), they found a direct relationship between total salt intake and %IDWG in the subgroup of anuria ESKD ($r = 0.26$; $p < 0.05$) and MAP in participants who were not taking antihypertensive agents ($r = 0.35$; $p < 0.05$). The results of this study showed that ESKD on hemodialysis had a high intake of salt, associated with %IDWG, MAP and schooling **(Fabiana et al., 2013).**

A Cross sectional study was conducted to assess the pulmonary hypertension among ESKD undergoing hemodialysis. The researcher selected 69 hemodialysis ESKD for a period of 3 months at Imam Hospital, Iran. The cardiologist performed 16 echo cardiogram to find the estimated systolic pulmonary artery pressure (PAP) more than or equal to 25 mm Hg. The average age of the patient was 52.6 + 15.3 years. The average duration of the hemodialysis was 39 + 36 months. The average ejection fraction was 45 + 7%. The prevalence of pulmonary hypertension was 62.3%. These ESKD was more likely to have lower ejection fraction. The study was concluded that pulmonary hypertension is a common problem among End Stage Renal Disease ESKD undergoing maintenance hemodialysis and it is strongly associated with heart failure. **(Hayati et al., 2017).**

A randomized controlled trial study was conducted to evaluate the effectiveness of chair stand exercise on activity of daily living in hemodialysis ESKD. The researcher randomly selected 27 ESKD, among them 17 completed the study. The change in Functional Independent Measure (FIM) from baseline was higher in the intervention group (1[1-3] vs. 0[0-0], median (minimum to maximum), $p < .001$) due to the significant progress in the FIM subscales related to morbidity and locomotion (stair) and significant difference present in thigh

circumference and 17 the physical factor summary score of health related quality of life by medical outcome study 36 item Short-Form health survey. Finding of this study, more than 60 years of hemodialysis patient's ADL was improved through chair stand exercise **(Matsufuji et al., 2014).**

Effectiveness of community based intervention on BMI among ESKD patients.

Obesity is a potent risk factor for the development of kidney disease. It increases the risk of developing major risk factors for chronic kidney disease (CKD), like diabetes and hypertension, and it has a direct impact on the development of CKD and ESKD (**Reynolds K et al, 2007).**

Elsayed EF et al (2008) The explained obesity, as well as the related CKD, is largely preventable. Education and awareness of the risks of obesity and a healthy lifestyle, including proper nutrition and exercise, can dramatically help in preventing obesity and kidney disease. This article reviews the association of obesity with kidney disease on the occasion of the 2017 World Kidney Day.

High body mass index (BMI) relates to metabolic disorders that can act as a risk factor for micro vascular complication. Therefore, obese ESKD are more likely to develop diabetic micro vascular kidney complication when compared with the normal BMI ESKD (**Foster m et al, 2008)**. In addition, this study focused primary health care education at rural area about dietary habits, community based intake, regular health checkup.

Harjo Kaur (2017) conducted a study on the feasibility of a structured group education session to improve self - management of blood pressure and BMI in people with chronic kidney disease, the sample size was 80, and evidence-based structure group educational intervention was given. The study revealed that the structured group education programme was feasible.

A quasi experimental study was conducted in Hong Kong to study the effect of a cognitive behavioural therapy programme for self-care on haemodialysis ESKD. 22 subjects were selected using purposive sampling technique and a nurse delivered haemodialysis patient education programme incorporating cognitive behavioural therapy was administered and the daily weight gain rates and salt intake were evaluated. Results showed that the daily salt intake decreased and the daily weight gain rates also decreased revealing that the cognitive behaviour therapy had a longer effect in haemodialysis ESKD **(Nozaki C et al, 2005).**

Effectiveness of community based intervention on urea and creatinine among ESKD patients.

In hemodialysis ESKD, increased serum creatinine level has been associated with greater survival, whereas lower serum creatinine level has been associated with increased mortality. **Walther CP et al (2012)** an observational cohort studies among 81 ESKD on maintenance hemodialysis at our Veterans Affairs unit. Pre dialysis serum creatinine and change in serum creatinine between midweek dialysis sessions served as the predictor variables These findings suggest that Pre dialysis creatinine and interdialytic change in creatinine are both strongly associated with proxies of community based status and mortality in hemodialysis ESKD.

Tsay SL et al, (2005) conducted a study on the management of ESKD and preventing the progression of renal disease. In this study focused quasi-experimental research design and a structured teaching programme was given to the ESKD. The structured teaching program included the following, treating disease worsening conditions like diabetes mellitus, hypertension, anemia etc., and smoking cessation, urea, creatinine, magnesium and potassium restriction, antihypertensive therapy etc. The study report showed that these therapies were effective in preventing the progression of kidney disease in this selected samples.

A descriptive study was conducted to assess the patient perception of risk factor associated with Chronic Kidney Disease. 229 samples with Chronic Kidney Disease were selected for this study. Self-administered questionnaire was used to collect the data on the perception of risk factors associated with chronic kidney disease. The study results showed that majority (89.1%) of ESKD were aware of their disease, whereas (31.5%) of samples were not aware of their serum creatinine level compared to (15.4%) of samples were not aware of their previous serum glucose level. Majority of the samples (92.1%) of them were identified hypertension and 86% of them were identified diabetes as the risk factors for Chronic Kidney disease. The study concluded that educational interventional research studies are needed in early stages of Chronic Kidney Disease **(Tan AU et al., 2010)**

Effectiveness of community based intervention on magnesium among ESKD patients.

The kidney has a vital role in magnesium homeostasis and, although the renal handling of magnesium is highly adaptable, this ability deteriorates when renal function declines significantly. In ESKD, increases in the fractional excretion of magnesium largely compensate for the loss of glomerular filtration rate to maintain normal serum magnesium levels **(Dewitte K et al, 2004).**

Ford (2009) conducted a quasi-experimental study to find out the effect of diet education knowledge of hemodialysis patient with clinical parameters which consists hypermagnesemia and uremia among dialysis patient in the outpatient dialysis center in the southern state, USA. Structured teaching was given regarding community based intake, diet management and physiological function and normal range of parameters and its complications. The results showed that the ESKD received health education monthly showed positive changes.

The study concluded that an educational intervention can bring about a desirable change in knowledge among hemodialysis ESRD regarding diet.

John Cunningham et al (2012) explained in a study Magnesium in chronic kidney disease Stages 3 and 4 and in dialysis ESKD among 55 ESKD undergoing dialysis, the effect of various magnesium and calcium dialysate concentrations has been investigated in haemodialysis. Results showed that, hemodialysis ESKD' ionized magnesium concentrations were often slightly elevated above the normal range and have been shown to be dependent on residual renal function and recommended medical professionals to develop and implement patient education about diet and level magnesium maintenance.

An experimental study was conducted among eight haemodialysis ESKD to find out the effectiveness of serum ionized calcium (iCa) and magnesium (iMg) on the blood pressure response during haemodialysis. Before dialysis and at 4 minutes intervals BP measurements and other haemodynamic parameters were obtained from the experimental and control group which showed a considerable drop in blood pressure in ESKD treated with calcium and magnesium contributing to intra diastolic hypotension. Spearman's correlation coefficient showed M).75 at P<0.05 level of significance's **(John Kyriazis et al, 2004).**

A quasi-experimental study was conducted in the United States to study the effect of education on diet, the laboratory values and knowledge of haemodialysis ESKD with hyperphosphatemia. Random sampling was done and the sample size was 63 with 32 in the experimental group who received routine laboratory review plus 20-30 minutes diet education. Results revealed that those ESKD who received extra education monthly showed positive changes (3.021, P<0.05) than the control group (0.064, P<0.01) which may be beneficial in reducing hyperphosphatemia **(Ford JC et al, 2004).**

Leenders, N., & Vervloet, M. G. (2019) Conducted epidemiological associations between magnesium and overall and cardiovascular survival in ESKD with CKD. Hemodialysis with a dialysate magnesium concentration of 0.75 mmol/L generally results in a stable plasma magnesium concentration ranging between 1.10 and 1.21 mmol/L. the study revealed that on hemodialysis with a dialysate magnesium concentration of 0.50 mmol/L, in the majority of ESKD an intra-dialytic decline of plasma magnesium concentration occurred, even if pre-dialysis concentrations were as low as 0.75 mmol/L . Magnesium is essential for the ESKD undergoing haemodialysis. Therefore, it's an important aspect to provide CB I based education on magnesium intake was recommended.

Literature related to effectiveness of community based intervention on life style modification among ESKD patients.

A randomised control trial study was conducted to investigate the effects of an Adaptation Training Programme (ATP) to improve the quality of life of ESKD. 57 samples were selected using purposive sampling technique and provided educational component based on need, assessment, cognitive behaviors modification, problems solving and stress management was given. Results showed statistically significant results (t=2.93, P=0.005) indicating that interventional techniques like adaptation training programme empowers ESKD to take advantage of available resources and take control over the situation **(Shiow-Luan et al, 2004)**

A study was conducted on assessment of dietary management of patient on dialysis at Hail Hospital. The researcher selected 27 males and 33 females who had received dialysis. All ESKD who were received dialysis were participated in this study. 60 questionnaire were submitted to collect information about dietary intake. The result showed that, the average age of the ESKD were between 15 – 80 years, among them men were between 50 – 90kg of weight and women were between 49 – 90kg of weight and average height of men 150 – 170cm and women149 –161cm.Hemodialysis 40% and peritoneal dialysis 66.7%. 45% of ESKD felt physically weak, 46.7% of them had kidney disease with hypertension. Only 50% of the ESKD received nutrition education. Most of the ESKD did not follow the community based and healthy diet, lack of exercise. The ESKD need nutrition education to maintain their health and to reduce complications **(Shadia et al., 2014)**

Buke (2016) stated that modification of lifestyle habits like smoking cessation, exercise, moderate alcohol consumption, and weight loss in obese people will slow the progression of chronic kidney disease. Diet is considered 0ne of the treatment of chronic kidney disease. Dietary advice includes information about energy, protein, sodium phosphate, potassium, and fluid. The overall aim is to prevent malnutrition, hyperkalemia, hyperphosphatemia, and obesity and to aid in the treatment of hypertension and alleviate the uremic symptom, a balanced healthy diet to meet individual community based requirements.

A randomized controlled trial study was conducted to evaluate the effectiveness of chair stand exercise on activity of daily living in hemodialysis ESKD. The researcher randomly selected 27 ESKD, among them 17 completed the study. The change in Functional Independent Measure (FIM) from baseline was higher in the intervention group (1[1-3] vs. 0[0-0], median (minimum to maximum),p< .001) due to the significant progress in the FIM subscales related to morbidity and locomotion (stair) and significant difference present in thigh circumference and 17the physical factor summary score of health related quality of life by medical outcome study 36 item Short-Form health survey. Finding of this study, more than60 years of hemodialysis patient's ADL

was improved through chair stand exercise **(Matsufuji et al., 2014).**

Jain, Deepak (2018) conducted a study to assess the knowledge of medication for chronic kidney disease among chronic kidney disease ESKD and to evaluate the impact of education on their knowledge of medication. The study population consisted of 90 ESKD were randomized into 2 groups. Baseline medication knowledge of these ESRD was assessed by using medication knowledge questionnaire developed for the study. The result showed that medication knowledge of the chronic kidney disease ESKD was extremely poor regarding the name, indication and dosage regimen of their medication. The study concluded that the need for the continued education for the chronic kidney disease patient for the better understanding of the medications they use.

An interventional study was conducted to assess the effectiveness of diet therapy programme on knowledge and practice of elderly ESKD undergoing hemodialysis. The study was conducted in hemodialysis units of Urology and 15 Nephrology centers at Zagazing university Hospital. 90 samples were selected for this study through simple random sampling technique. The data was collected through interview method to assess the socio demographic variables of ESKD, dietary knowledge and practice, physical assessment checklist was used to assess the abnormal physical findings of the ESKD before and after intervention. The results of this study revealed that the diet therapy program was effective to improve the knowledge and practices. After the intervention there was a statistically significant improvement in knowledge and practice (61.1% and 67.8%). The study concluded that, Diet Therapy programs are essential in the management of elderly ESKD undergoing hemodialysis **(Eman et al., 2015).**

CONCLUSION:

This research presented the review of literature related to the studies on community based intervention on clinical parameters of haemodialysis ESKD with ESKD need for information on haemodialysis and effectiveness of CBI on haemodialysis. This review enabled the investigator to gain deep insight in to the methodology content for the tool, data collection procedure and analysis. Further it may help the investigator to study the effectiveness of CBI on haemodilaysis.

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