SAS Journal of Medicine ISSN 2454-5112
SAS J. Med., Volume-2; Issue-3 (May-Jun, 2016); p-55-63
Available online at http://sassociety.com/sasjm/

Original Research Article

Assessment of the Renal Replacement Therapy Knowledge among Kirkuk Population and Its Relation with Education Status

Dr. Abdullah Adil Raoof
Department of Medicine, College of Medicine, Kerkuk University, Kirkuk, Iraq

***Corresponding author**
Dr. Abdullah Adil Raoof
Email: dr.abdullahkoprulu@gmail.com

Abstract: The population baseline knowledge about the RRT (renal replacement therapy) and its types is important in accepting and choosing one of its types, of course with discussion with doctor. The decision regarding starting dialysis is doctor's decision, but it needs patient and family cooperation and acceptance. Because of previous bad population experience in last decades regarding dialysis outcome and increased mortality in our city, this acceptance and cooperation is usually weak and the patient does not easily accept the idea of dialysis. This usually delays the dialysis treatment till the patient is toxic enough which makes delayed started dialysis less beneficial with increased mortality. I thought that the education level of patients and their families is key factor for the acceptance of early starting dialysis therapy. A descriptive, cross sectional study performed between first/ November/2013 and first /February/2014. The information collected from two groups of participants .the first group is the general population and the second group is the patient on dialysis. Informative questionnaire was designed to gather the related data. The questionnaire contains sociodemographic and data to assess the participant‹s knowledge, educational level and its effect on renal replacement therapy. The data collected from participants in Kirkuk city by direct interview during which a questionnaire was filled. All data collected from 490 participants. The sample education level ranging from low education (8.9%), intermediate education (32.8%) to high education (57.8%) which has an important relationship with acceptance, refusing and deciding about RRT. Around (51.5%) of the sample at different education level thinks that dialysis risk is higher than its benefit .The percentage of population refusing dialysis is (26.8%). About (75.7 %) refuses the idea of renal transplantation. The 55% of the sample population did not hear about cadaveric renal transplantation. A mean of 5.5 % of the population refuses cadaveric renal transplantation to & from their relatives. The population has poor information regarding kidney disease. Education level has impact on dialysis initiation, choosing the type of RRT, early creation of vascular access, improved quality of life. Pre-dialysis education program is not present in Kirkuk hospital. It is very important to design this program in Kirkuk hospitals.

Keywords: renal replacement therapy, Dialysis education.

INTRODUCTION

Various epidemiologic studies attempted to clarify the incidence and prevalence of CKD and have made relatively similar observations suggesting a prevalence of CKD of around 10%, albuminuria (mostly microalbuminuria) of around 7%, and GFR below 60 ml/min per 1.73 m2 of around 3% [1].

Any patient living with a chronic renal disease should be offered counseling, information and educational activities. The aim of Educational programs is to improve patient's quality of life. Behaviors, professional practices and positions are changing throughout the process of implementing educational activities. Healthcare providers have to gain new skills to deal at the same time with the care and the cure [2].

End-stage renal disease (ESRD) is almost unique in that patients may choose (and can later change) their treatment modality, if there are no contraindications [3]. Education to assist this choice is mandatory in some countries [3].

Proven benefits of renal replacement therapy option education include: reduced urgent dialysis starts; reduced time spent in hospital and improved resource utilization [4]. Earlier placement of permanent vascular access or peritoneal catheter [5] a greater likelihood of choosing a self-care modality [6] extended time to requiring dialysis [7] improved adherence [2] reduced anxiety and fears [8] and reduced mortality [9]. These benefits lead to considerable cost savings [4].

Education plays a key role in helping patients adjust to their kidney disease, but many individuals

remain uninformed about the effect that RRT will have upon their lives. Mehrotra found that most pre-ESRD patients have a lack of knowledge regarding RRT options [10]. Other studies have found similar results [11, 12]. Poor adherence to diet, medications, and treatment schedules may be the result of ineffective or unavailable education efforts [13]. Additionally, education might permit better-informed decisions about dialysis access and the issues patients face when they require ESRD care [14]. Optimally, education could reduce the 'urgent starts' that lead to increased morbidity, mortality, and costs as therapy is initiated [15, 16].

In response to the aging population and trends of dialyzing older and sicker patients, interest is growing in nondialytic (conservative treatment) alternatives for end-stage renal disease (ESRD). The Renal Physicians Association recently updated their practice guideline affirming the rights of patients to refuse dialysis initiation [17].

The UK Renal Association recommends discussing the risks and benefits of renal replacement therapy prior to dialysis initiation with special attention to nutritional status, comorbid conditions, and functional status [18, 19].

The renal replacement therapy (HD, PD, renal transplantation) when advised by the doctors; it is not easily accepted by the patients and their family in Kirkuk city. The population baseline knowledge and education about the RRT and its types is important in accepting and correct choosing of one of its types [3], of course with discussion with doctor. The decision regarding starting dialysis is doctor, decision, but it needs a patient, acceptance and cooperation. This acceptance and cooperation is usually weak and the patient not easily accepts the idea of dialysis**.** This usually delays the dialysis treatment till the patient to be clinically toxic enough which makes delayed started dialysis less beneficial with increased mortality.

Several studies have shown that the presence, duration and intensity of nephrological care before the initiation of dialysis treatment have an impact on the morbidity and mortality of patients during dialysis [20].

To overcome this problem many country design (it is not present in our country) a pre dialysis (care) education program .This care should begin at CKD stage 4 (e GFR 30 ml/min per 1.73 m2). One aim of a predialysis program is to ensure that patients and their families know as much as they wish to know about renal failure and its treatment before dialysis needs to be started. This may take months rather than days in patients who have difficulty accepting information about their illness but who may gain particular benefit from the program [21].

Predialysis care is best delivered by a multidisciplinary team [22, 23]. Such teams commonly include a dietitian, a nurse educator, a pharmacist, a social worker, and sometimes a trained peer support volunteer.

Patients receiving this additional care have better biochemical results, are more likely to start dialysis in a planned way with less hospitalization, and may even have improved survival rates once they have started dialysis [24].

Education about RRT should be given to all patients and their families as they approach ESRD and should include the rationale, efficacy, and prognosis of each RRT modality as well as information about any relevant limitations of medical resources [1]. Other studies have also shown that structured pre-dialysis education programmes are associated with a high uptake of self-care treatment modalities [25] and therefore should form an integral part of any dialysis-counseling program [22].

An adequate, objective and early pre dialysis education program could allow a high percentage of patients to start a self-care RRT modality. It is appear that by leaving the choice to the patients and by offering all treatment modalities, an optimal distribution can be obtained, leaving in-center dialysis for patients needing medical and nursing care, or for patients not wishing to participate in their treatment [26].

AIM OF STUDY

Assessment of the level of population and dialysis patient knowledge about the renal replacement therapy and the impact of education level on the decision for dialysis and renal transplantation.

SUBJETS & METHODS

A descriptive, cross sectional study performed to assess the RRT knowledge between 1st November/2013 and 1st February/2013. The information collected from two groups of participants .The first group is the general population (no. 380) age range from 21- 65 year, 46.3% were male, 53.6 % were female, 86.8 % were living in urban while 13.15% were from rural area .educational level was 8.9% illiterate ,32.8% intermediate education, 57.8% high educated. the second group is the patients on dialysis (no.110) age range from 18 - 56 year, 65.4 % were male, 34.5 % were female, 66.3% were living in urban while 33.6% were from rural area .educational level was 61.8 % illiterate, 30.9% intermediate education , 7.27 % high educated . Informative questionnaire was designed to gather the related data. The questionnaire contains socio demographic and data to assess the participant's knowledge, education level and its effect on renal replacement therapy. The data collected from participants in Kirkuk city by direct interview during

which a questionnaire was filled. Data were collected from a total 490 participants.

STATISTICAL ANALYSIS

A structured questionnaire was designed to be used to gather data regarding demographic and socioeconomic attributes. Statistical analysis was carried out using available software (SPSS version 15) and chi-square was used to compare the significant difference between groups. The interpretation of the result was done through the measurement of p value with statistically significant effect when p value is < 0.05 (Daniel 2005).

RESULTS

Table (1A) shows the sociodemographic status of the general population - group A) sample from the total of 380, 198 (52.1 %) of population sample are below 30 years , 160 (42.1%) are between 30-60 year old, the remaining 22 (5.78 %) are above 60 year. 176 (46.3%) are male 204 (53.6%) are female. 330 (86.84%) are living in urban, and 50 (13.15%) are living in rural area . 35 (9.2%) are illiterate, 125 (32.8%) are intermediate education (primary &secondary school) , 220 (57.8%) are highly educated. 104 (27.36 %) are medical occupational, while 276 (72.63%) are non medical.

Table (1 B) the sociodemographic status the studied (dialysis patient – group B) sample. From the total of 110, the 12 (10.9 %) of population sample are below 30 years, 68 (61.8 %) are between 30-60 year old, the remaining 30 (27.2 %) are above 60 year. 72 (65.4 %) are male, 38 (34.5 %) are female. 73 (66.3 %) are living in urban, and 37 (33.6 %) are living in rural area . 68 (61.8 %) are not educated , 34 (30.9 %) are intermediate education (primary &secondary school), 8 (7.27 %) are highly educated .

Table 2 and 3 shows that most of the participant did not have a chance of adequate education regarding CKD (89.09%), RRT (79.09 %), and about (85.4 %) of them are not satisfied about their education status about their disease. Although these information is in adequate, the table 3 shows the source of these information .The main source is the doctors (office) (87.27 %) the second source is hospital (4.5 %), medical staff (1.81 %), and other sources including media (6.36 %) .

Table (4) shows the relationship between educational level & study population knowledge about risk factors for kidney disease and kidney protection. Most (about 75.5%) of total study population knows the risk factors of kidney disease and how to protect their kidneys. But (24.2%) of them does not know .The figure also shows that the percentage of study population .who know kidney protection is increasing from 4.8 % to 17.7% to 77.4% by increasing the educational level from illiterate, intermediate, to high educational respectively.

Table (5) shows that 53.1% of population study thinks that dialysis is not beneficial. Most of the not educated group (73.91 %) thinks that dialysis is not beneficial but with increasing the level of education the percentage is decreasing to only (41.7 %) in those with high educated level.

Table (6) shows that about quarter (26.8%) of the total population did not accept dialysis treatment for their relatives. around (30%) of illiterate and intermediate education group refuse dialysis treatment to one of their relatives . but the (unexpected) high disagreement percentage was in intermediate education group which reaches about 80.5 %.

Table (7) Shows from the total, a bout quarter of them (24.21 %) refuse the renal transplantation (which is relatively high percentage that it should be modified but remaining (75.78%) accept renal transplantation. The medical occupation group has higher percent of renal transplant acceptance than the non-medical group. 16.3% of medical group and 83.6 % of nonmedical group refuse renal transplantation.

Table (8) Shows that (55%) of the population they did not hear about cadaveric renal transplantation which is one of good available option for renal transplantation.

Table (9) Shows that, if it is available, about (32.1 %) of study population accept but (67.8 %) refuse the cadaveric renal transplantation ,among those who are accept the non-medical group (expected high educated group) have high acceptance idea (76.2 %) compared to medical group with acceptance rate of (23.7 %). Those who are refusing, (29.45 %) of them are medical group (expected higher educational group) which is a relatively higher refusal rate in spite of being educated group. This data may suggest that factors other than medical education may have impact on decision make for cadaveric renal transplantation. These factors may be religious, cultural, social factors and others. Again for future success of this important part of renal transplantation, this high percent of disagreement idea among the population should be modified.

Table 1A: Sociodemographic state of general population participant shared in study

Variable		Number	Percentage
Age	<30 Year	198	52.1%
	30-60 Year	160	42.1%
	> 60 Year	22	5.78 %
Gender	Male	176	46.3%
	Female	204	53.6%
Residence	Urban	330	86.84%
	Rural	50	13.15%
Education level			
Illitrate		35	8.9%
Intermediate		125	32.8%
High education		220	57.8%
Occupation	Medical	104	27.36 %
	Non medical	276	72.63%
Total no.		380	

Table 1B: Sociodemographic state of dialysis patient participant shared in study

Variable		Number	Percentage
Age	<30 Y	12	10.9 %
	30-60 Y	68	61.8 %
	> 60 Y	30	27.2 %
Gender	Male	72	65.4 %
	Female	38	34 .5 %
Residence	Urban	73	66.3 %
	Rural	37	33.6 %
Education level			
Illitrate		68	61.8 %
Intermediate		34	30.9 %
High education		8	7.27 %
Total no.		110	

Table 2: Adequate education receive before dialysis

Adequate education receiving before dialysis					
	YES		NO		
	%	No.	%	No.	
Regarding CKD	10.9 %	12	89.09 %	98	110
Regarding RRT	20.9 %	23	79.09 %	87	
Satisfaction regarding predialysis education	14.5 %	16	85.4 %	94	110

Table 3: The source of information

Information source		
Source	No.	Percent
Doctors (office)	96	87.27 %
Hospital	5	4.5 %
Medical stuffs	2	1.81%
Others like media including internet	7	6.36%
	110	100%

Table 4: The relationship between education level and knowledge regarding kidney risk factors and how to protect the kidney

	Dialysis is beneficial effect			
Educational level	YES		NO	
Illiterate	6	26 %	17	73.91%
Intermediate education	49	33.5%	97	66.43%
High education	123	58.2%	88	41.7%
Total	178	46.8%	202	53.1%
chi-sq=25.433	df = 2		p < 0.05	

Table 5: The relationship between education level and the dialysis beneficial effect

Educational level	YES		NO		TOTAL
Illiterate	No.	%	No.	%	25
	14	4.8%	11	44%	
Intermediate education	51	17.77%	25	32.8%	76
High education	223	77.4%	56	20.07%	279
Total	288	75.7%	92	24.2%	380
chi-sq =11.064	d f = 2		p < 0.05		

Table 6: Relationship education level with dialysis acceptance

Education level	Dialysis acceptance for one of relatives			
	N0		YES	
Illiterate	No.	%	No	%
	8	30%	18	69.2%
Intermediate education	27	19.4%	112	80.5%
High education	67	31.1%	148	68.8%
Total	102	26.8%	278	73.15 %
chi-sq =6.143	d f =2	p <0.05		

Table 7: Relationship between the occupation level and renal transplantation acceptance

Occupation	Renal transplantation acceptance				
	Yes		No		Total
Medical	90	31.25%	15	16.3%	105
Non-medical	198	68.75	77	83.6%	275
Total	288	75.78%	92	24.21%	380
chi-sq =11.028	df = 1	p < 0.05			

Table 8: Relationship occupation and knowledge regarding cadaveric renal transplantation

Occupation	Hearing about the cadaveric renal transplantation				
	NO		YES		TOTAL
Medical	50	23.9%	55	32.1%	105
Non-medical	159	76.07 %	116	67.83%	275
Total	209	55%	171	45 %	380
chi-sq. = 3.552 df = 1 p> 0.05					

Table 9: The relationship between occupation level and cadaveric renal transplant acceptance

Occupation	Cadaveric renal transplantation acceptance to one of relatives.				
	Yes		No		Total (%)
Medical	29	27.6% 23.7 %	76	29.45%	105 (27.6 %)
Non- medical	93	33.6% 76.2%	182	70.5%	275 (72.3 %)
Total	122	32.1%	258	67.8%	380
chi-sq = 1.340	d f = 1	p > 0.05			

DISCUSSION

This study shows that participant education regarding kidney disease is very poor and our patients did not receive adequate education regarding the nature of their renal disease, options of renal replacement therapy and conservative therapy. Simple explanation of this is the absence of predialysis education programme in our hospitals.

This poor education status has its impact on the acceptance of dialysis, choosing the type of RRT, early preparation of vascular access, reducing complication of emergency dialysis, improving the symptoms. This need to be changed by pre dialysis education program regarding, kidney disease, management option of RRT, vascular access.

The educational level of a person and the family is very important factor for correct decision making in any situation and at any time. This is most important especially in regard health education. In this study, 75.7% of the population study knew how they protect their kidneys, and the knowledge had parallel increase with education level.

Other studies state that, there appears to be limited knowledge regarding basic information about the kidney. For example, patients did not seem to understand some of the kidney's actions, as over a third of our participants did not know that the kidney makes urine [27]. Other Studies suggest that patients want to know more about what can be done to protect existing kidney function, including information on appropriate use of medications, and guidance in understanding the meaning and interpretation of tests used to monitor potential disease progression [28, 29].

As mentioned by Lindberg *et al*, education programs for CKD patients help increase the number of patients receiving early permanent vascular access placement, as well as the proportion of patients creating Arteriovenous fistula as opposed to grafts or temporary catheters [5]. Manns *et al* in other study mention that, a two-phase educational intervention can increase the proportion of patients who intend to initiate dialysis with self-care dialysis [6].

Devins *et al* in other study states that, Predialysis psychoeducational interventions increase patient knowledge about chronic kidney disease (CKD) and its treatment and extend time to dialysis therapy without compromising physical well-being in the short run [21].

Gutiérrez Vilaplana *et al* in their study mention that, the group educational programme was effective on the defined psychological outcomes in predialysis patients. Hence, it should be available for all clients [8].

This study shows that, Because of absence of organized education program for patients in our hospitals, the main source of information is the doctor's office. This is usually in adequate because of its short time, absence of materials, no details that needed to satisfy the patient and his family.

This is comparable with Fadem *et al* who state, the survey disclosed a general patient preference for physician-based education because 60.2% of respondents felt the most valued resource for information was the physician. Such a preference does not discount the abilities of other professionals to make important contributions to comprehensive patient education as CKD progresses [30].

The predialysis education program is not present in our hospitals. This program should be started in each hospital. The programme should be designed to involve all aspects of renal disease in order to satisfy the patients and their family .Although, even in countries which adopt predialysis education programme there is variable degree of successfulness. Isnard Bagnis *et al* show that . In practice, however, there is only moderate patient satisfaction with renal replacement therapy option education [30, 31].

The reasons include: (i) programme content not reflecting patient needs [2]; (ii) programme does not stress that patients have an active choice of modality [32]; (iii) main motivators for the patient (flexibility, independence, feelings of security [33]. are not taken into account; (iv) materials used in programme are of poor quality [34] or unproven effectiveness in chronic kidney disease (CKD) patients; (v) potential bias on side of healthcare professionals (HCP) towards a particular modality [35].

In this study most patient and their families are debates about the beneficial effect of dialysis and some thinks that dialysis by itself kills the patient. According to this study around 50% of the population (at all educational level) thinks that the dialysis is harmful. It means that the chance of accepting dialysis is at best will be 50 %. From a total of 380 general population participant, 102 (26.8 %) are refuse dialysis treatment for their relative. Their education level as follows illiterate 30%, intermediate 19.4 %, high education 31.1%. This means that this relatively high percent of patient should be treated conservatively (especially in elderly). Although with higher symptom incidence, higher mortality rate, poorer quality of life. Nowadays conservative management is considered to be one of the accepted treatment option especially for elderly patient. This is because of associated comorbidity, economic burden of dialysis, poor dialysis outcome with elderly patient, relatively accepted result with this group of patient. this comparable with O'Connor *et al* who mention that , Even when dialysis can be expected to prolong survival, the burdens of

dialysis (cost, infections, vascular access issues, fluctuating blood pressure) deserve careful consideration [18].

As mentioned by the recent longitudinal cohort study found that functional status with nondialytic management remains relatively constant until the last month of life [36]. A second study of conservative management found an increase in symptom distress and health related concerns in the last two months of life [37].

Conservative management is an important alternative to discuss when counseling patients and families about dialysis. Unlike withdrawal of dialysis in which imminent death is expected, patients who decline dialysis initiation can live for months to years with appropriate supportive care [18]. In response to the aging population and trends of dialyzing older and sicker patients, interest is growing in nondialytic alternatives for end-stage renal disease (ESRD) [18].

We thought that this high percent of dialysis unacceptance may be related to many factors

1. Poor health education regarding chronic kidney disease, RRT, vascular access.
2. The most patient usually have incorrect source of advice, (family, neighbor, friends, and the important one is the miss used sick visit, although religiously is a very good and a nice thing but it is miss used and the visitors advice the patient (incorrectly) to avoid dialysis treatment.
3. Difficulty of patient transfer to hospital three times per week .as there is no hospital service for patient transfer which makes further economic load to patient.
4. Most patients think that dialysis means (cleaning of the kidney to make it to return to function). And this process is usually unsuccessful and killing one.
5. (Starting dialysis make patient dependent on it) this is a myths that make patient to refuse dialysis or delay it.
6. Factors other than education level, like religious, social, cultural may has impact on RRT decision.
7. Because of a negative ideas and bad previous population experience about the renal replacement therapy in last decade.

This study shows the non-medical group (with expected lower health education) had higher percentage of renal transplantation refusal 28.57% in comparison with medical group (with expected higher health education) with 12 % refusal rate. This figure scores toward the education effect on RRT. Renal transplantation is the best option for renal failure patient and it is cost effective. That's why this high figure of refusal rate should be dealt with and modified.

Cadaveric renal transplantation (transplantation from a patient with a brain death) is one of the good available option (source) for kidney donation in many countries (it is not available in our country). Cadaveric renal transplantation needs special organized system that coordinate between donors (usually the patient's family) and the receiver (patient in waiting list). The health care authorities are needed to create this system in our country but population support is very important in maintaining this option by providing kidney donation for patient in waiting list. 55% of the total study population did not hear about the cadaveric renal transplantation. These data shows poor population information regarding this subject which needs support and education.

This study shows that, if it is available , (32.1 %) of study population accept but (67.8 %) refuse the cadaveric renal transplantation .among those who accept, the non-medical group have high acceptance idea (76.2 %) compared to medical group with acceptance rate of (23.7 %). The unexpected result of this figure shows that the more educated group (medical group) has more refusal rate in comparison to the less educated (non-medical group) group. This figure may suggest that factors other than medical education may have impact on decision making regarding cadaveric renal transplantation. These factors may be religious, cultural, social factors and others. Again for future success of this important part of renal transplantation, this high percent of disagreement idea among the population should be modified.

CONCLUSIONS

1. Not all options of RRT are present in Kirkuk city.
2. Population knowledge regarding renal replacement therapy is poor needs to be improved.
3. Population has badly (negative ideas) regarding RRT it should be modified.
4. Population need education program about RRT direct toward
    a. General population.
    b. Patient with chronic kidney disease with future need for dialysis.
5. Cadaveric kidney is available but we need to create an optimum environment (donor, receiver, law, and ethics) to make cadaveric renal transplantation possible.
6. There is a gap between usual education and health education. The usual school education program should contain health education.
7. Negative advices from the patient surrounding (family members, Friend, neighbor) may delay the dialysis treatment.
8. Factors other than education level, like religious, social, cultural may has impact on RRT decision.

RECOMMENDATIONS

It is recommended to...

1. Design multidisciplinary predialysis education (care) program.

2. Create an optimum environment (donor, receiver, law, ethics, and religious thinks) to make cadaveric renal transplantation be possible.
3. Kirkuk city needs well equipped, guideline directed dialysis and renal transplant unit.
4. Health authority must make all RRT option available
5. Use of broadcasting materials *(Tv, Radio, Internnet, Newspapers, Magazines*) to change the present negative ideas in the population.
6. Search for the factors contributing for the bad outcome of RRT in Kirkuk city for future plan for correction of these factors.
7. Creation of future cadaveric renal transplant system.

REFERENCES

1. Floege J, Johnson RJ, Feehally J; Comprehensive clinical nephrology, saunders elsever, fourth edition, 2010; 1019-1030.
2. Tourette-Turgis C, Isnard-Bagnis C; Journal Article, Patient Education Handout. Nephrologie & Therapeutique, 2013; 9(4):235-240.
3. Covic A, Bammens B, Lobbedez T, Segall L, Heimbürger O, Van Biesen W, Fouque D, Vanholder R; Educating end-stage renal disease patients on dialysis modality selection. NDT plus, 2010; 059.
4. Levin A, Lewis M, Mortiboy P, Faber S, Hare I, Porter EC, Mendelssohn DC; Multidisciplinary predialysis programs: quantification and limitations of their impact on patient outcomes in two Canadian settings. American Journal of Kidney Diseases, 1997; 29(4):533-40.
5. Lindberg JS, Husserl FE, Ross JL, Jackson D, Scarlata D, Nussbaum J, Cohen A, Elzein H; Impact of multidisciplinary, early renal education on vascular access placement. Nephrology news & issues, 2005; 9(3):35-6.
6. Manns BJ, Taub K, Vanderstraeten C, Jones H, Mills C, Visser M, Mclaughlin K; The impact of education on chronic kidney disease patients' plans to initiate dialysis with self-care dialysis: a randomized trial. Kidney international, 2005; 68(4):1777-83.
7. Devins GM, Mendelssohn DC, Barré PE, Binik YM; Predialysis psychoeducational intervention and coping styles influence time to dialysis in chronic kidney disease. American Journal of Kidney Diseases, 2003; 42(4):693-703.
8. Vilaplana JM, Zampieron A, Craver L, Buja A; Evaluation of psychological outcomes following the intervention 'teaching group': study on predialysis patients. Journal of renal care, 2009; 35(3):159-64.
9. Wu IW, Wang SY, Hsu KH, Lee CC, Sun CY, Tsai CJ, Wu MS; Multidisciplinary predialysis education decreases the incidence of dialysis and reduces mortality—a controlled cohort study based on the NKF/DOQI guidelines. Nephrology Dialysis Transplantation, 2009; 259.
10. Mehrotra R, Marsh D, Vonesh E, Peters V, Nissenson A; Patient education and access of ESRD patients to renal replacement therapies beyond in-center hemodialysis. Kidney Int., 2005; 68: 378–390.
11. Abbott KC, Glanton CW, Trespalacios FC, Oliver DK, Ortiz MI, Agodoa LY, Cruess DF, Kimmel PL; Body mass index, dialysis modality, and survival: analysis of the United States renal data system dialysis morbidity and mortality wave II study. Kidney international, 2004; 65(2):597-605.
12. Morton RL, Tong A, Howard K, Snelling P, Webster AC; The views of patients and careers in treatment decision making for chronic kidney disease: Systematic review and thematic synthesis of qualitative studies. BMJ, 2010; 340: c112.
13. Curtis CE, Rothstein M, Hong BA; Stage-specific educational interventions for patients with end-stage renal disease: Psychological and psychiatric considerations. Prog Transplant, 2009; 19: 18–24.
14. Collins AJ, Foley RN, Gilbertson DT, Chen SC; The state of chronic kidney disease, ESRD, and morbidity and mortality in the first year of dialysis. Clin J Am Soc Nephrol., 2009; 4: S5–S11.
15. Levin A; Consequences of late referral on patient outcomes. Nephrol Dial Transplant., 2000; 15(3):8–13.
16. Golper T; Patient education: Can it maximize the success of therapy? Nephrol Dial Transplant, 2001; 16: 20–24.
17. Rockville MD; The Renal Physicians Association; 2010. Shared decision-making in the appropriate initiation of and withdrawal from dialysis.
18. O'Connor RN, Pallavi K; Conservative Management of End-Stage Renal Disease without Dialysis: A Systematic Review. J Palliat Med., 2012; 15(2): 228–235.
19. United Kingdom; UK Renal Association. Planning, initiating, withdrawal of renal replacement therapy, 2009.
20. Smart NA, Titus TT; Outcomes of early versus late nephrology referral in chronic kidney disease: a systematic review. Am J Med., 2011; 124: 1073–1080.
21. Devins GM, Mendelssohn DC, Barré PE, Binik YM Predialysis psychoeducational intervention and coping styles influence time to dialysis in chronic kidney disease. Am J Kidney Dis., 2003; 42:693-703.
22. Curtis BM, Ravani P, Malberti F, Kennett F, Taylor PA, Djurdjev O, Levin A; The short-and long-term impact of multi-disciplinary clinics in addition to standard nephrology care on patient outcomes. Nephrology Dialysis Transplantation, 2005; 20(1):147-54.
23. Goldstein M, Yassa T, Dacouris N, McFarlane P; Multidisciplinary predialysis care and morbidity

and mortality of patients on dialysis. AmJ Kidney Dis., 2004; 44:706-714.

24. Hemmelgarn BR, Manns BJ, Zhang J, Tonelli M, Klarenbach S, Walsh M, Culleton BF; Alberta Kidney Disease Network. Association between multidisciplinary care and survival for elderly patients with chronic kidney disease. Journal of the American Society of Nephrology, 2007; 18(3):993-9.
25. Goovaerts T, Jadoul M, Goffin E; Influence of a pre-dialysis education programme (PDEP) on the mode of renal replacement therapy. Nephrol Dial Transplant, 2005; 20: 1842–1847.
26. Little J, Irwin A, Marshall T, Rayner H, Smith S; Predicting a patient's choice of dialysis modality: experience in a United Kingdom renal department. Am J Kidney Dis., 2001; 37: 981–986.
27. Wright JA, Wallston KA, Elasy TA, Ikizler TA, Cavanaugh KL; Development and results of a kidney disease knowledge survey given to patients with CKD. American journal of kidney diseases, 2011; 57(3):387-95.
28. Schatell D, Ellstrom-Calder A, Alt PS, Garland JS; Survey of CKD patients reveals significant gaps in knowledge about kidney disease. Part 2. Nephrol News Issues, 2003; 17(6):17–19.
29. Coupe D; Making decisions about dialysis options: an audit of patients' views. Edtna Erca J, 1998; 24(1):25–26. 31.
30. Fadem SZ, Walker DR, Abbott G, Friedman AL, Goldman R, Sexton S, Buettner K, Robinson K, Peters TG; Satisfaction with renal replacement therapy and education: the American Association of Kidney Patients survey. Clinical Journal of the American Society of Nephrology, 2011; 6(3):605-12.
31. Pastor JL, Julián JC; Claves del proceso de información y elección de modalidad de diálisis en pacientes con insuficiencia renal crónica. Nefrologia, 2010; 1(Suppl Ext1): 15–20.
32. Winterbottom A, Bekker HL, Conner M, Mooney A; Choosing dialysis modality: decision making in a chronic illness context. Health Expectations, 2014; 17(5):710-23.
33. Lee A, Gudex C, Povlsen JV, Bonnevie B, Nielsen CP; Patients' views regarding choice of dialysis modality. Nephrology Dialysis Transplantation, 2008; 23(12):3953-9.
34. Winterbottom A, Conner M, Mooney A, Bekker HL; Evaluating the quality of patient leaflets about renal replacement therapy across UK renal units. Nephrology Dialysis Transplantation, 2007; 22(8):2291-6.
35. Isnard Bagnis C, Crepaldi C, Dean J; Quality standards for predialysis education: results from a consensus conference. Nephrol Dial Transplant, 2015; 30(7):1058-66.
36. Murtagh FE, Addington-Hall JM, Higginson IJ; End-stage renal disease: A new trajectory of functional decline in the last year of life. J Am Geriatr Soc., 2011; 59:304–308.
37. Murtagh FE, Sheerin NS, Addington-Hall J, Higginson IJ; Trajectories of illness in stage 5 chronic kidney disease: A longitudinal study of patient symptoms in the last year of life. Clin J Am Soc Nephrol., 2011; 6:1580–1590.