

Therapeutic Compliance in Patients with Chronic Kidney Disease Undergoing Hemodialysis -clinical case study-

الامتثال العلاجي لدى مرضى القصور الكلوي المزمن الخاضعين للدياليز
-دراسة حالة عيادية-

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Abstract:

This current article aims for diagnosing the behavior of Therapeutic Compliance in patients with chronic kidney disease undergoing hemodialysis, by identifying their compliance to the medical recommendation, and their response to certain conditions of their therapy by diet adherence, liquids intake, keeping away from smoking and alcohol and drogues, as well as taking medicines, and the discipline to the appointments of hemodialysis. This study is based on the clinical approach -single case study- in which the study sample included one case of an adult man who suffers from chronic kidney disease under hemodialysis. To address this study was based on clinical observation, clinical interviews, and the Clinical Rating Scale of Compliance in Chronic Hemodialysis Patients by François Main and others (1999), in which the study discovers that the patient adheres to a fair level of medical recommendations, where it responds to certain conditions and neglects others. Based on the results obtained, have suggested psychological interventions for non-compliance to medical recommendations in chronic kidney disease such as Educational Interventions, Cognitive behavioral therapy (CBT), rational-emotive therapy (RET), positive psychology interventions, and motivational interviewing.

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Keywords: therapeutic compliance — Chronic Kidney Disease — Hemodialysis —Interventions
for non-compliance behavior.

المخلص:

تهدف الدراسة الحالية إلى تشخيص سلوك الامتثال العلاجي لدى مريض القصور الكلوي المزمن الخاضع لتصفية الدم، من خلال التعرف على التزامه للتعليمات الطبية، واستجابته لبعض شروط علاجه من التزام بالحمية وإنقاص للسوائل وابتعاد عن التدخين والكحول وتناول أدويته وانضباطه بمواعيد تصفية الدم. الدراسة الحالية اتبع فيها المنهج العيادي-دراسة الحالة-واشتملت عينة الدراسة حالة واحدة شاب يعاني من قصور كلوي مزمن خاضع لتصفية الدم. ولمعالجة موضوع الدراسة تم الاستناد على المقابلات العيادية ومقياس سلوك الامتثال العلاجي compliance rating scale من إعداد François. Mai وزملائه (1999) ، وكشفت الدراسة إلى أن الحالة تمثل بمستوى متوسط للتعليمات الطبية، فتستجيب لبعض شروط العلاج وتتهاون في أخرى.

وبناءً على النتائج التي توصلنا إليها، تم اقتراح تدخلات نفسية لعدم الامتثال للتوصيات الطبية في أمراض الكلى المزمنة، التي يمكن للأخصائي النفسي توظيفها من أجل تعزيز التزام المرضى الخاضعين للدياليز بالعلاج والتوصيات الصحية. وأهم هذه الاستراتيجيات: التدخلات التعليمية، العلاج السلوكي المعرفي (CBT)، العلاج العقلاني الانفعالي (RET)، تدخلات علم النفس الإيجابي والمقابلات التحفيزية.

الكلمات المفتاحية:

الامتثال العلاجي؛ القصور الكلوي المزمن؛ الدياليز (تصفية الدم) ؛ التدخلات العلاجية النفسية لسلوك عدم الامتثال.

1- Introduction :

Chronic kidney disease (CKD) is a public health issue that affects over 10% of the global population (Pedro García-Martínez, et al., 2021). In Algeria (2022), according to Professor Taher Rayan, there are 4 million Algerians who suffer from chronic kidney disease. 26,000 of them are undergoing hemodialysis. Also, the number of people diagnosed with this disease in Algeria is rising at a rate of 3000 patients annually, and 15,000 patients with Chronic Kidney Disease are waiting for renal

transplantation, and this number is expected to increase (عبدوش ، (بن طاهر، 2022) 2022)

Moreover, its prevalence is expected to rise rapidly in light of population aging and increasing prevalence of risk factors for developing CKD, such as diabetes and hypertension (Alicia M. de Vries, et al., 2017), in contrast, patients with chronic kidney disease may experience unwanted physiological symptoms such as dry skin, itching, tiredness, or loss of energy, which can affect activities of daily living and self-care. (Pedro García-Martínez, et al., 2021)

Kidney disease that necessitates life-sustaining renal replacement therapy such as dialysis or renal transplantation. Renal transplantation is the preferred treatment for End-stage renal disease due to its reduced mortality risk. (Laupacis, Koewn, Nancy, Krauger, & All, 1996) However, kidney transplantation may not be

Hemodialysis is the most frequent treatment method for CKD. However, it has been argued that a number of restrictions and modifications accompany this treatment (Fotoula Babatsikou & S.K. Gerogianni, 2014), and is regarded as a burdensome therapy because it entails a stringent and time-consuming therapeutic routine, dietary and fluid restrictions, and a high medication intake. (Laupacis, Koewn, Nancy, Krauger, & All, 1996).

Therapeutic management of the Chronic kidney disease patient is based on pharmacological measures as well as lifestyle modifications or changes in routine that include healthy habits, and visits to the health center for dialysis. (Pedro García-Martínez, et al., 2021)

All of these changes that occur in the patient with Chronic Kidney Disease Undergoing Hemodialysis necessitate adherence to treatment and changes in his lifestyle so that his condition does not deteriorate.

Further, compliance is defined as “The extent to which the patient’s behavior matches agreed recommendations from the prescriber” (Nick, Horne, Weinman, Elliott,

& Morgan, 2005), As most chronic diseases, in general, requiring long-term medical treatment are often the subject of complications linked to the development of various diseases due to the lack of respect for medical prescriptions. Research has been conducted to identify the challenges of therapeutic adherence to reduce morbidity and mortality factors. (SAIL Hadda, 2015)

The problem of therapeutic compliance, probably as old as the history of medicine, is linked to the doctor-patient relationship, within a framework that confers on the doctor an authority enabling him to prescribe a treatment and impose certain behaviors that involve behaviors to follow. From diagnosis to the prescription of treatment, the doctor expects obedience from the patient. (SAIL Hadda, 2015)

In Chronic kidney disease, a chronic illness, Individual management becomes prominent in adherence to the treatment (Ahrari S, 2014). Compliance of the patients to the treatment is an important indicator showing that chronic diseases are managed successfully. Adherence of the patients to diet, salt, fluid restrictions, and drug treatment is considered important in effectively managing the problems to be faced, increasing the success of the treatment, and reducing morbidity and mortality. However, studies showed that patients could not adhere to the diet, fluid restrictions, and drug treatment at the desired level (Güneş, 2018). As a result, adherence to pharmacological therapy and lifestyle modification, disease-imposed restrictions, such as numerous visits to hemodialysis centers, fluid restriction, and diet, necessitate psychological interventions to assist the patient in adhering.

For the aforesaid reasons, this study aimed to identify and diagnose therapeutic compliance behavior in Patients with Chronic Kidney Disease undergoing Hemodialysis, through a single case study, with the suggestion of some psychological interventions to promote compliance.

Note: In this article, we dealt with the terms compliance and adherence, as they refer to the same characteristic: the extent to which the patient can adhere to the doctor's recommendations.

2- Materials and Methods:

2.1 Design:

The study was conducted in a hospital in Setif (Algeria) in 2018. and all study procedures were approved by the administration of the university and the hospital.

2.2 Tool/Instruments

We relied on the single case study, based on the dimensions that we highlighted at the beginning of the study, namely the diagnosis of therapeutic adherence behavior, because the single-case studies can provide a viable alternative to large-group studies such as disease history, patient/ doctor relationship, and even notes on the patient's present situation. we use the clinical observation, clinical interview, and Clinical Rating Scale of Compliance in Chronic Hemodialysis.

2.2.1 Clinical observation:

A clinical observation, is a result, answer, judgment, or knowledge gained from the act of observing a patient or a specimen from a patient in healthcare (Russler, 2009). Clinical observation is used by skilled clinicians, doctors, and therapists in order to glean information about their patients. They are observations of behavior from the patients that are used in order to determine a diagnosis and treatment plan. (Observation, n.d) For our current study, we highlighted the points we want to examine in hemodialysis patients, for example, Appearance and grooming, Attendance timetable for hemodialysis, sessions missed, and Patient Relationships with the medical team, and other patients.

2.2.2 Clinical interview:

A clinical interview is a tool that helps psychologists, and researchers make an accurate diagnosis of a variety of mental illnesses (Kelly, 2020). We performed five interviews with the patient, which were as follows: Conduct an interview for collecting biographical information, An interview to collect information about the history of the disease, An interview about the patient's present illness situation, An interview with the healthcare provider (the attending doctor), finely an interview to apply Compliance Scale.

2.2.3 Clinical Rating Scale of Compliance :

Clinical Rating Scale of Compliance in Chronic Hemodialysis Patients (CRS) by François Main and others (1999). The scale has developed and tested its validity and reliability on a sample of 48 of 65 patients undergoing hemodialysis treatment at the Ottawa General Hospital in June 1994, Patients underwent a 10–15-minute interview, with 1 of 2 independent clinical interviewers, regarding diet, fluid intake, prescribed medication usage, smoking, alcohol or drug use, and hemodialysis treatment attendance. Following each interview, a predesigned 3-point rating scale evaluates compliance in each of the 6 domains (yielding an 18-point total score). (Francois Mai, 1999) . The Arabic version of the Clinical Rating Scale of Compliance in Chronic Hemodialysis Patients was translated by Zenad Dalila, and the Arabic version is characterized by validity and reliability through the correlation coefficient between the results of the test and re-test, which was estimated by 0.988 (زناد، 2013)

3- Results:

3.1 Case Description:

An adult man "N" is 31 years old, with an average educational level, his marital status is single, and he is the youngest son, he resides in Setif - Algeria, lives with his family, he works as a driver where his economic status is average, and he still works in spite of his illness., he suffers from Chronic Kidney Disease (kidney failure -KF- receiving hemodialysis) since 2011.

3.2 Medical report:

The examining doctor provided us, patient "N", with a diagnosis of his health status, in which patient "N" suffers from kidney failure for nine years, and hypertension was the reason behind it, as well as he suffers from heart valves disease and he has had a surgical Intervention on heart valves one year after the chronic kidney disease. The doctor also added that renal transplantation, after his heart disease, becomes nearly impossible. As the therapeutic compliance, the examining doctor also mentioned that patient "N" is dutiful and attends continuously to sessions of hemodialysis and not missing them.

3.3 Psychological report:

The patient "N" suffers from many chronic organic diseases (chronic kidney disease undergoing hemodialysis, hypertension, and heart valve disease). When he was only 24 years old, he was diagnosed with chronic kidney disease. and the interference of the age variable has complicated the issue, which caused an emotional response in the patient that was identified as being in denial, as evidenced by his statement "When I was diagnosed with CKD, and in my early years, I could not accept that" however, I tried to adapt to it". He also added in one of his statements that his illness makes him bored, especially with what he needs to change about his lifestyle as well as the limitations imposed by dialysis

sessions, saying "Hemodialysis is scheduled every other day, the thing that I am tired of "

Concerning his heart valve disease developing, he tried to attribute the cause of his heart disease, after just one year of announcing his diagnosis of CKD, to psychological factors represented in his inability to emotional expression, in which the patient mentioned that "Since my CKD, I became unable to express my feelings, emotions, and all my problems that I no longer want to talk about it "

What we've noticed during the total interviews is that the patient avoids talking about the subject of renal transplantation from the first interview, in which he didn't declare only in the last interview that renal transplantation is nearly impossible after the patient "N" was diagnosed with CKD; he was about doing a kidney transplant where the donor was his mother, where there was a mismatch in blood group (-0), in all tissues as well, and during the other examinations for doing renal transplantation, it has been shown that the patient suffers from heart valve disease. Therefore, the renal transplantation intervention was canceled. and he is undergoing surgery for heart valve replacement.

As the patient is set to undergo another surgery intervention on the prosthetic valve, he expresses his trust in God, and undergoing the operation by saying, "I am not worried about having this surgery, I must do it as soon as possible". However, his behavior demonstrates the complete opposite, as the patient was postponing the necessary examinations of this operation.

The patient has been subjected to hemodialysis since 2011 at the hospital in Setif, where the patient attends three times weekly (Sunday, Tuesday, and Thursday) for an average of four hours a day (from 11 h to 15 h). What we have noticed during our field study is that the patient's attendance during hemodialysis

sessions is on time or a bit earlier, which means he wouldn't miss the hemodialysis sessions, as confirmed by the examining doctor.

Moreover, he doesn't seem like a chronic patient and is on dialysis; he is so heedful about his physical appearance and is well-dressed, one-of-a-kind, and active, which helps him communicate easily with the medical and paramedical teams. He also added that we, the patients, and the medical team are like one big family at the center of hemodialysis.

In terms of the evidence from the interview concerning treatment adherence, a set of questions has been asked about the predictability of the patient's adherence to his treatment. Before tackling the scale results, we should build on certain statements of the patient concerning the subject of treatment adherence. For diet, the patient has mentioned that he doesn't keep his diet properly, which is shown in his statement, "Sometimes, I have a craving for certain foods, so I eat them." As for the theme of fluids, the patient has shown that he doesn't adhere to liquid loss according to his statement "I cannot bear not drinking water; in each session and rarely of dialysis, I must lose 5 kg.", Regarding taking medicines, the patient has mentioned that he adheres to taking his medicines as prescribed by the doctor forgets them. And concerning smoking, he showed average responses by saying "I don't smoke much since my diagnosis, and the number of cigarettes that I smoke is between one and two per day", Regarding alcohol and drug abuse, the patient has completely stopped after his Kidney failure, and for attendance, the patient was disciplined in attending hemodialysis sessions, as we noticed during our presence at the center of hemodialysis.

3.4 Results of Clinical Rating Scale of Compliance:

After the application of the Clinical Rating Scale of Compliance, we came up with the following results and distributed them to six dimensions:

3.4.1 Diet

The response of the patient was low in this dimension (one score), so the patient has poor adherence to the diet. He understands the need for dietary restrictions but largely ignores them.

3.4.2 Medication

The response of the patient was medium in this dimension (two scores); the patient has fair adherence; he understands the need to take medications regularly as prescribed and adheres most of the time, but has frequent lapses.

3.4.3 Fluids

The response of the patient was low in this dimension (one score); the patient has poor adherence to losing fluids, and he understands the need for fluid restrictions but largely ignores them.

3.4.4 Smoking

The response of the patient was medium in this dimension (two scores), the patient has a fair adherence to keeping away from smoking. Generally, he understands the need to quit smoking and tries to adhere, but has frequent lapses (less than 10 cigarettes daily).

3.4.5 Alcohol and drugs

The response of the patient was good in this dimension (three scores); the patient has good adherence to keeping alcohol and drugs, understands the need to quit alcohol and drugs, and generally adheres to this well.

3.4.6 Attendance

The response of the patient was good in this dimension (three scores); the patient has good adherence in attendance and keeps all dialysis appointments.

Table 01 Clinical Rating Scale of Compliance Scores

Diet	1/3
Medication	2/3
Fluids	1/3
Smoking	2/3
Alcohol and drugs	3/3
Attendance	3/3

The total scores obtained by the patient on the Clinical Rating Scale of Compliance were 12 scores, and the overall score on the scale was 18. Therefore, the patient adheres to a fair level of medical recommendations, as well as responding properly to certain conditions of the treatment (attendance and alcohol) and responding with a medium score to both (smoking and medicines). As for liquids and diet, the patient was being too careless about that.

4- Discussion:

Non-compliance to treatment is the most common problem in the medical community, particularly among patients undergoing hemodialysis for chronic kidney disease. As doctors often complain about their patients who are not subject to medical recommendations relating to hemodialysis.

Although hemodialysis helps to compensate for some of the kidney's declining capabilities, It enables patients to live normal lives and carry out their daily routines normally. However, despite what dialysis provides to the patient, it does not compensate for all the functions of the kidney. As a result, these patients must adhere to additional conditions and lifestyle changes in addition to the hemodialysis machine. (زنتاد، 2013) which are the dimensions addressed by the Clinical Rating Scale of Compliance (Diet, Fluids, Medication, Smoking, Alcohol and drugs, Attendance). (Francois Mai, 1999) Patients with CKD who undergo dialysis have acquired a therapeutic compliance behavior if these recommendations are followed.

Compliance is the compatibility of the patient's behavior with the recommendations created by the self-care provider. Through our presentation of the results, We found that the patient follows some instructions but dismisses others, especially in terms of fluids and diet. and arguably the most fundamental reason for patients not to follow these recommendations is that dialysis does not totally eliminate chronic renal disease.

The present finding is consistent with the results of a study in Turkey by Dilek Acar and Zeynep Güneş (2018) As the percentage of patients who adhere to a diet and fluids was low, It was found that 36,4% of the patients adhered to their diet, 37,3% of them adhered to fluid restriction and 50,8% of them adhered to medicines.

In our study, the patient reasons that he is not obligated to adhere to all of the treatment's limits as long as the disease does not go away. Justifying that he attends the sessions of dialysis and stopped taking alcohol and drugs. Attending dialysis sessions regularly may be due to the good relationship between the patient and other patients and the medical staff in the hemodialysis center in the hospital. Through Fotoula Babatsikou (2014) Psychosocial patient's adherence to a regular hemodialysis program depends on the personality of the patient in conjunction with the support received from health professionals, family, and social environment. In our study, we found also that the patient is not fully aware of the dangers of non-adherence with other conditions for treatment (diet and fluids), and is not aware that dialysis leaves long-term other effects such as anemia, heart disorders, and metabolic disorders. and following the treatment condition protects the patient from disease complications and postpones them.

The patient was unaware of the consequences of non-adherence to treatment. Even the patient was unaware that one of the complications of CKD is heart

disease; according to the Examining Doctor's report, the patient's infection with heart valve disease occurred immediately after his renal disease, the patient was not adhering to the dialysis conditions in his first year, and he was rejecting completely the idea of having a CKD. Through these statements, We may explain the aggravation of the disease as a result of non-adherence, and non-adherence as a result of a lack of acceptance of the illness, as well as the length of the stage of denial following the announcement of the diagnosis. and the patient's perceptions of his illness were distorted, a way where he was always trying to attribute the causes of his disease and its aggravation to external factors such as bad luck. And he goes through severe emotional states due to his illness, and while he is partially able to live and work regularly through dialysis, his chronic illness cannot be managed.

5- Interventions to improve adherence in chronic kidney disease:

Among individuals with chronic kidney disease, including those with kidney failure (KF) receiving hemodialysis, adherence to medications, dialysis treatments, fluid restriction, and a healthy diet is associated with improved physical health, including a reduced risk of hospitalizations and mortality. (Fotheringham, 2020) (Umeukeje & al, 2018)

As long as the objective of adherence is decreased mortality and hospitalization risk. Based on the findings of previously discussed studies and the results of our current study, Most of them concluded that patients with chronic kidney disease undergoing hemodialysis did not follow treatment and prescription instructions well. We tried to suggest some psychological interventions that improve or promote adherence to treatment and medical recommendations in patients with chronic kidney disease undergoing dialysis.

Interventions have been developed to both promote adherence to dialysis self-care activities and to increase physical activity. Those that focus on adherence to medications, dietary change, and dialysis sessions have been somewhat helpful. In a recent systematic review and meta-analysis of 36 randomised, controlled trials ($N = 3510$), 28 of 36 led to improvements in one or more study outcomes, and meta-analyses showed that the interventions led to small- to medium-sized reductions in phosphate levels (standardised mean difference [SMD] = -0.45) and small-sized reductions in interdialytic weight gain (SMD = -0.20). (Karumathil, et al., 2019)

Studies examining strategies to improve adherence in dialysis patients have broadly targeted four domains of treatment: adherence to dietary, fluid intake, attendance to dialysis sessions, and medication. (Matteson & Russell, 2010)

We identified three strategies that most studies found to be beneficial in improving adherence to treatment in patients with chronic kidney disease, including those with kidney failure (KF) receiving hemodialysis, as follows:

5.1 Educational Interventions:

Based on our results, it appears that the patient is not fully aware of the dangers of non-adherence with other conditions for dialysis treatment (diet and fluids) and is not aware that dialysis leaves long-term side effects. Therefore, we believe that educating patients about their disease and its implications is the first step in improving adherence to treatment and both primary and secondary prevention of Chronic Kidney Disease.

There is increasing evidence that educational interventions aimed at empowering patients are successful in chronic disease management. (Jo Mason, Kamlesh, Stone, Farooqi, & Sue, 2008) and Therapeutic patient education is a useful approach for the management of the majority of chronic diseases, majority of

studies clearly show an improvement in health outcomes, including Quality of Life, induced by patient education. The positive impact of therapeutic patient education on these outcomes is between 50% and 80%. (Lagger, Pataky, & Golay, 2010) . CKD education is the process of informing patients with chronic kidney disease (CKD) about their condition, treatment options, and lifestyle changes, CKD education may improve patients' knowledge, outcomes, and quality of life across the stages of kidney disease (Narva, Norton , & Boulware, 2016)

In chronic kidney disease, some researchers suggested certain educational interventions such as Shahram Baraza and al (2009) suggesting how educational intervention promotes adherence to Diet, Fluid, and Medication. Their intervention was as follows: Oral education lasting 30 minutes each over two group sessions and a booklet "A patient's guide to controlling dietary regimen" vs Video education lasting 30 minutes during hemodialysis sessions with similar content including diet, the importance of Adherence ... The Outcome of this intervention is relevant to treatment adherence Change in interdialytic weight gain (IDWG), Change in phosphate, calcium, and potassium levels (Karumathil, et al, 2019).

Also, Ione de Brito Ashurst and Hamish Dobbie (2003) were suggesting in their study how educational intervention promotes adherence to diet and medication, Their intervention was as follows: One-on-one education session by Dietitian based on "A Patient's guide to keeping healthy: Managing your phosphate". Also, provided a Medication chart to fill in self-administered doses of medications and blood results to increase patient engagement. The Outcome of this intervention relevant to treatment adherence is a Change in phosphate, calcium, and calcium x phosphate product levels.

5.2 Cognitive behavioral therapy (CBT) & rational-emotive therapy (RET):

Based on our results, the patient has cognitive distortions about his illness. He is continuously seeking to attribute the causes of his condition and its worsening to external sources like bad luck. And, as a result of his illness, he suffers severe emotional states, and while he is partially able to live and work on a regular basis with dialysis, his chronic illness cannot be treated. In relation to cognitive distortions and unpleasant emotions, the most efficacious therapies that can be suggested are CBT and RET. Modifying distorted cognitions and managing negative emotions leads to improve adherence behaviors.

In chronic kidney disease, Some of the researchers suggested CBT and RET such as Cukor Daniel, and al (2014) motioned that CBT improves Fluid Adherence in Hemodialysis, Their intervention was as follows: Cognitive behavioral therapy is delivered chairside by a psychologist over 60 minutes per 3 months. Included psycho-education emphasising the difference between depression and medical illness, components of adherence targeting dialysis compliance, adapting behavioral activation, and identifying End-stage renal disease (ESRD) specific cognitive distortions. The Outcome of this intervention relevant to treatment adherence is a Change in interdialytic weight gain (IDWG).

Furthermore, a China study by Hou Yong-Mei and al (2010) showed that RET improves adherence to fluid. Rational emotive therapy establishes a good patient-caregiver relationship with a structured program with an introduction providing basic knowledge and psychological health, a description of rational emotive therapy and ABC theory, and the procedure of rational emotive therapy in three phases including psycho-diagnosis, comprehension, and application. The Outcome of this intervention relevant to treatment adherence is a Change in interdialytic

weight gain (IDWG), levels of blood pressure, and ultrafiltration volume.
(Karumathil, et al., 2019)

5.3 Novel health behavior intervention:

In the United States in 2022, Christopher Celano and al, suggested a novel health behavior intervention to promote adherence in kidney failure. (Christopher M. Celano, et al., 2028) on 12 weeks, their interventions are based on phone-delivered, positive psychology, motivational interviewing, and intervention to promote psychological well-being and adherence in Kidney Failure. They used Single-arm, proof-of-concept trial with sample $N = 10$ adults with KF undergoing hemodialysis and reporting suboptimal adherence to physical activity, diet, and/or medications. Participants attended weekly phone sessions with a study trainer, completed weekly positive psychology exercises (focused on gratitude, strengths, and meaning), and worked towards physical activity, diet, and/or medication goals. The study's findings were as follows: Participants completed 78% of sessions and rated the program's components as easy to complete (positive psychology: 8.7 ± 1.5 ; MI: 8.3 ± 2.0) and subjectively helpful (positive psychology: 8.8 ± 1.2 ; MI: 8.8 ± 1.6). The intervention led to promising but nonsignificant improvements in psychological and adherence measures. This phone-delivered 12-week program was practicable, well accepted, and linked with nonsignificant gains in health behavior adherence, underlining the need for an extended efficacy trial.

Although this study should be replicated with more participants for better outcomes, it did provide insight into interventions to improve adherence, It focused on more than one health behavior, and It favored positive psychology rather than negative psychology.

Though most interventions focus on only one or two health behaviors, and no interventions combine a focus on dialysis self-care and physical activity, despite the potential benefits of both. Many interventions are intensive, require multiple staff members to deliver, and may be difficult to implement in clinical practice. And most exercise training programs have occurred during dialysis sessions, rather than at home; this may limit the development of long-term physical activity habits that may be required to have cardiovascular benefits. And few interventions have focused on psychological constructs that have been linked to adherence and health. (Christopher M. Celano, et al., 2028)

6- Conclusion:

Treatment of patients with chronic kidney disease (CKD), including those with renal failure (KF), who have not been able to undergo renal transplantation, they are subjected to permanent dialysis and a change in lifestyle, This requires adherence to treatment and medical recommendations, especially attendance at hemodialysis sessions, taking medicines, eating a healthy diet, losing fluids, and staying away from smoking, alcohol, and drugs. Successful treatment of patients with CKD requires the individual's adherence to this complex and critically important therapeutic regimen, improving the knowledge of patients having hemodialysis, changing their distorted cognitions, and promoting their health behaviors are all things that should be an integral part of treatment. Therefore, the treatment of patients with CKD undergoing dialysis requires the interventions of a multidisciplinary team, including doctors, nurses, psychologists, and dietitians....

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