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# Adherence, Anxiety and Depression Associated With Hemodialysis Treatment in Patients with Chronic Kidney Disease

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**Abstract:- Chronic kidney disease (CKD) in recent years has had an increase in its prevalence and incidence; in Ecuador it is estimated that about 10,000 people are on hemodialysis and peritoneal dialysis treatment, it is important to note that patients on hemodialysis go through various alterations at the physical, psychological and social levels. In Guayas there are 4,387,434 inhabitants, of which 2,600 people would have chronic renal insufficiency and if 90% of these patients opt for hemodialysis therapy, we would have a total of 2,340 cases. Objective: To determine adherence, anxiety and depression associated with hemodialytic treatment in patients with chronic kidney disease.**

**A non-experimental design study of cross-sectional, descriptive-correlational, prospective and quantitative approach was carried out. The sample consisted of 328 patients with a diagnosis of chronic renal disease residing in the province of Guayas, according to the Sierra Bravo formula of 1988. Inclusion criteria were applied to agree to participate voluntarily in the research and people with previously diagnosed psychiatric pathologies were excluded.**

***Keywords:-*** *Adherence, Anxiety, Depression, Treatment, Hemodialysis.*

## I. INTRODUCTION

Chronic renal failure is a worldwide public health problem that affects people regardless of age, sex, race, economic status or other social determinants of health, with an increase in the number of patients on a global scale [1].

As a consequence of the above, the number of people in Ecuador who need to resort to dialysis and/or renal transplantation procedures is increasing and, therefore, the cost of public and private care is progressively increasing. We will study this reality at the level of the population of the province of Guayas, since according to the research context it has been observed that adherence to hemodialytic treatment by patients with chronic kidney disease is influenced by different sociodemographic characteristics that are related to psychosocial factors such as anxiety and depression that if not determined in a timely manner would be causing therapeutic instability in this population [2].

Countries with a wide development in the field of hemodialysis, such as Spain, Germany and the United States, have developed great scientific advances and thus the options of renal replacement therapies have multiplied, allowing the patient to freely choose the one that best suits his or her lifestyle. However, for the patient with impaired renal function, knowing the diagnosis of chronic kidney disease becomes a paradigm for his state of health, producing a great impact on family and social dynamics, since it is worrying to know that he needs a hemodialysis machine to survive [8].

It is necessary to take into account that in most cases the psychological part is the most affected, the same that directly affects adherence to hemodialytic treatment, this situation is justified when analyzing the coping situation that the patient is living, in addition to the little support he/she receives from the family environment; Therefore, in divergence with the above, there are still few studies aimed at determining precisely how the emotional state is related to the states of anxiety and depression in renal patients and adherence to hemodialytic treatment, a problem that motivated the interest in conducting this study [9].

Chronic kidney disease is a pathology that with the passing of time has become a pandemic worldwide, which not only involves knowing the substantial costs that arise to cover the treatment of individuals who suffer from it, but also to identify the emotional alterations that lead to further deterioration of their state of health, concluding in most cases in the abandonment of treatment or even worse in death [3].

The purpose of this research is to determine adherence, anxiety and depression associated with hemodialytic treatment in patients with chronic kidney disease, for which an analysis of international and national research on the subject has been carried out. Of these investigations, special interest has been placed on those that have implemented reliable instruments as a tool for collecting information, in order to extract those indicators applicable to my research [10].

On the other hand, a sociodemographic survey has been elaborated to find out which variables are most associated with adherence to hemodialysis therapy. The contribution of the present research plan will focus mainly on an exposition of the anxiety and depression presented by patients undergoing hemodialysis treatment [11].

The information obtained in the present study is of great help for the implementation of programs that identify the psychosocial alterations associated with the sociodemographic factor in order to intervene in a timely manner in the patient's therapy [12].

The approval of an ethics committee was necessary for the databases, since the data will be obtained from the application of three instruments, including sociodemographic questions, two validated questionnaires: State-Trait Anxiety Inventory, STAI, Spielberger, Gorsuch and Lushene (1999) and IDER State-Trait Depression Inventory of Spielberger, Buela-Casal, and Agudelo (2008), reliability of the instruments higher than 0.90 and the updated version of the therapeutic adherence scale, for all the above mentioned this study is feasible in the following areas: social, psychological, therapeutic, legal and ethical [21].

➢ *Chronic kidney disease*

CKD is defined as a group of heterogeneous diseases that affect renal structure and function. The diagnosis and classification of this disease, published by the Kidney Disease Outcomes Quality Initiative (K/DOQI), establishes the aforementioned condition as renal damage (objectified by proteinuria or anatomical abnormalities) or the presence of a glomerular filtration rate of less than 60 ml/min/1.73 m2 for 3 months or the presence of renal damage [6].

➢ *Ranking*

Five stages are described in its classification, determined by glomerular filtration rate values, being grade 5 the diagnostic stage for hemodialysis.

*Table 1:- Based on Glomerular Filtration Rate [7].*

| **Estadios de filtrado glomerular** |
|---|
| G1 TFG >90 ml/min por 1.73 m2 |
| G2 TFG 60 a 89 ml/min por 1.73 m2 |
| G3a TFG 45 a 59 ml/min por 1.73 m2 |
| G3b TFG 30 a 44 ml/min por 1.73 m2 |
| G4 TFG 15 a 29 ml/min por 1.73 m2 |
| G5 TFG <15 ml/min por 1.73 m2. |

➢ *Causes*

The main causes of CKD include a history of type 2 diabetes mellitus, which accounts for 30% of cases, arterial hypertension (25%), followed by glomerulopathies (20%), the common denominator of which is poor control during the course of the disease [8].

➢ *Complications*

Among the most common and frequent symptoms in the intradialysis period are hypotension, muscle cramps, headache, nausea and vomiting, while those associated with other pathologies are more frequent cardiac arrhythmias[8].

According to Mojena et al in their study, arrhythmias constituted 29% being the most common complication followed by hypotension with 25%, cramps with 16% and nausea with 10% [9].

❖ *Hemodialytic treatment in chronic kidney disease*

➢ *Hemodialysis*

It is a renal replacement therapy that consists of the use of an extracorporeal circuit and a dialyzer that resembles certain kidney functions, specifically the exocrine ones, including the elimination of toxins and excess fluids [10].

In another context, hemodialysis is based on three physicochemical principles: diffusion, convection and absorption, by means of which blood and dialysate liquids are interposed in different compartments so that by means of a semi-permeable membrane formed inside the dialyzer or filter the exchange of molecules occurs by means of a difference in pressure [10].

Patients undergoing hemodialysis treatment undergo various physical, psychological and social alterations. On the physical level, they experience systemic problems including cardiovascular, gastrointestinal, musculoskeletal and immunological problems. On the psychological level, mood disorders (depression, anxiety, denial), and on the social level, economic, family and personal problems [10].

➢ *Adherence to therapy*

The concept of adherence has been established by the World Health Organization as a patient's behavior related to taking medications, following habits that must be changed as part of their treatment, this topic is widely discussed by discipline, including nursing, medicine, psychology, physical therapy and nutrition[11].

Inadherence to therapy not only affects the health status of individuals, but also has an impact on the family and social environment of renal patients, such as the degree to which a person's behavior in taking medication, following a diet and implementing lifestyle changes corresponds to the agreed recommendations of a health care provider [12].

Inga B and Galván P. in their study determined that 70% of hemodialysis patients still do not accept the treatment; therefore, refusal is the main cause of therapeutic

inadequacy associated with other factors that stand out in the research [12].

Sánchez M. also demonstrated that factors such as lack of economic resources, lack of time and, in addition to this, scarce family support, directly influence patient absenteeism from renal treatment [13].

❖ *Sociodemographic and health determinants associated with adherence in people with chronic kidney disease.*

➢ *Sociodemographic factors*

Research over the years has identified variables directly associated with nonadherence to hemodialytic therapy, including advanced age, gender, low educational level, low economic resources, employment status and religious beliefs as the most influential and triggering factors for nonadherence to therapy [13].

➢ *Age*

Age is a factor that predisposes the patient to greater complications when it comes to chronic disease. Currently, the young adult population is being greatly affected by the presence of catastrophic diseases, including chronic kidney disease, mostly secondary to diabetes mellitus and hypertension, as well as older adults, which is why greater support should be considered in the treatment of this group in particular [13].

➢ *Gender*

Several studies make reference to the fact that the female sex has a greater denial before the diagnosis of a chronic disease, this is associated with her role as mother, and main caregiver of the home without leaving aside her role in society, however, some investigations differ from this context since they indicate that gender is not a variable that influences therapeutic adherence [14].

➢ *Marital Status*

Some articles mention that living as a couple or being married provides greater emotional support when dealing with a chronic disease, especially because it is important for human beings to feel loved and supported in situations where there is a compromise in health status [14].

➢ *Study level*

Multiple studies have shown that a primary education level is related to the patient's non-compliance with therapy, while those with a medium or high level of education have greater adherence and acceptance of therapy [15].

➢ *Employment and socioeconomic status*

In patients diagnosed with a chronic disease, the work situation becomes unstable so much so that those who have a job are forced to decide for a premature retirement and many even abandon their jobs or worse are fired untimely because of their condition, causing a total imbalance of their economy subject to their emotional stability motivating the patient to non-compliance with hemodialytic treatment [15].

➢ *Psycho-social factors*

These refer to the internal and external aspects that intervene in the way human beings perceive the disease: their emotional state, thoughts, sensations and behaviors that are commonly presented as a reaction to a pathology or a medical diagnosis. Psychosocial factors play a relevant role in the origin of diseases, in the assimilation of symptoms and in the results that remain in people's lives [16].

Mental health is defined as the balance of emotions, where the person has the ability to cope with the stresses that can occur in any situation in life, mood disorders and anxiety are common in the first six months of treatment, but when they exceed six months are of concern for mental health, showing the emergence of psychopathologies such as depression and other disorders, more common in women and at younger ages for both sexes [17].

❖ *Psychological effects*

➢ *Depression*

Depression tops the list of mood disorders, producing an increase in morbidity and mortality in these patients compared to other disorders, reflected in the lack of therapeutic adherence, especially in the attendance to hemodialytic therapy sessions [18].

Depressive states are also related to a higher number of hospital admissions, longer hospital stays and increased mortality in the same context [19].

➢ *Anxiety*

Anxiety has been consistently linked to cardiac problems, such as inflammatory processes, increased catecholamines, heart rate variability, altered endothelial function and the acquisition of potentially harmful behaviors (such as smoking or sedentary lifestyle), leading to further deterioration of the patient. Therefore, it is recommended that health professionals who treat patients undergoing hemodialysis begin to offer emotional support in the pre-dialysis stage to provide the patient with resources that will facilitate coping with the various changes that CKD will cause in his or her life [20].

❖ *Effects on social and intrafamily relationships*

➢ *Social and family support*

The renal patient, like any individual, needs the support of society to cope with the disease, being a determining factor for the human being because feeling identified with the social network that surrounds him is a source of motivation to go ahead with the renal treatment. As for family support, this can be provided by the couple, children and even friends, without forgetting the support of health personnel, considering that they are subject to this cognitive and emotional support [21]

➢ *General Objective*

To determine adherence, anxiety and depression associated with hemodialytic treatment in patients with chronic kidney disease.

➢ *Objective's specifics*

1. To determine the sociodemographic, clinical, anxiety and depression characteristics of the study population.
2. To determine adherence to hemodialytic treatment in the patients included in the study.
3. To analyze whether there is a relationship between sociodemographic, clinical characteristics, anxiety, depression and adherence to treatment in the study population.

## II. METHODOLOGY

❖ *Type of research*

Non-experimental, cross-sectional, descriptive-correlational, prospective and quantitative approach.

➢ *Population*

For the following study there will be a population of 650 patients from the province of Guayas with a diagnosis of Chronic Kidney Disease, with an age range of 18 to 65 years.

➢ *Sample*

A simple random sampling will be carried out. The sample will be constituted by 328 patients with a diagnosis of chronic kidney disease residing in the province of Guayas, according to the Sierra Bravo formula of 1988, the error (5%) that we make in the estimation of the sample size, starting from a confidence level of 95% would follow the following formula, taking Z=1,96:

$$n = \frac{Z_{\forall}^2 * p * q * N}{e^2 (N-1) + Z_{\forall}^2 p * q}$$

***Formula 1.*** *Sierra Bravo*

➢ *Inclusion and exclusion criteria*

We will include people who agree to participate voluntarily in the research with a diagnosis of end-stage chronic kidney disease and being on hemodialysis treatment for more than 3 months, being in an age range of 35 to 65 years old and residing in the province of Guayas. And, people with previously diagnosed psychiatric pathologies will be excluded.

➢ *Instruments*

The following instruments will be applied:

**Sociodemographic survey** that includes data such as age, sex, education, marital status and employment status.

**Chronic kidney disease variables:** time of disease, time on hemodialysis, number of sessions per week, institution that covers your treatment.

➢ *State-Trait Anxiety Inventory (STAI)*

It is a self-report composed of 40 items (Annex 2), consisting of two independent scales: Anxiety-State and Anxiety-Trait, the former evaluates a transitory emotional state, characterized by subjective feelings of attention and apprehension circumscribed to the moment of evaluation and accompanied by hyperactivity of the autonomic nervous system, while the Anxiety-Trait score indicates an anxious propensity, relatively stable, which characterizes individuals with a tendency to perceive situations as threatening. Each subscale consists of a total of 20 items in a 4-point Likert response system according to intensity (0= almost never/not at all; 1= somewhat/sometimes; 2= quite often; 3= very much/almost always). The total score in each of the subscales ranges from 0 to 60 points. In samples of the Spanish population, levels of internal consistency have been found that range, both for the total score and for each of the subscales, between 0.84 and 0.93.

➢ *Inventory of Depression State-Trait (IDER)*

The IDER (Annex 2) is a specific questionnaire consisting of 20 items, created by the same author of the STAI created by Spielberger in 1996 and adapted to Spanish by Buela-Casal and Agudelo (20008) aimed at assessing on the one hand the degree of affectation (State) and on the other hand the frequency of occurrence (Trait) that the subject shows in relation to the affective components of depression. In addition, the test items are constructed to assess both the presence of depression (Dysthymia) and the absence of depression (Euthymia). It is therefore an easy to apply tool, which overcomes many of the limitations of previous instruments and is very useful in aiding the diagnosis of depression and as a research instrument. Administration time of 7 to 10 minutes. It can be applied to adolescents and adults.

➢ *Therapeutic Adherence Scale (VSEAT)*

The updated version of Pedraza and Vega's 2018 therapeutic adherence scale is based on the therapeutic adherence scale (EAT; Soria, Vega & Nava, 2009), this update considers other guidelines that are applicable only to self-reports containing a Likert-type response scale, whose purpose is to evaluate a construct related to Clinical Psychology and/or health, This instrument responds to the need to have evidence to identify the frequency of occurrence of behaviors that are essential for the control of chronic diseases and also represents a working tool for various health professionals interested in learning about the psychological aspects of therapeutic adherence, and can be used both in the field of research and/or as a diagnostic tool, because adequate values were obtained for both conditions (reliability of 0. 70 for research objectives and 0.80 for diagnosis).

➢ *Procedure*

The research will be carried out by accessing the sample of the province of Guayas. A meeting via ZOOM will be organized with the participants in order to inform them of the research objectives. Then, home visits, telephone contact in some cases and online survey will be made for the application of the instruments detailed above, which will consist of collecting sociodemographic variables, chronic kidney disease: and providing the State-Trait Anxiety Inventory (STAI), State-Trait Depression Inventory (IDER) and the Therapeutic Adherence Scale (VSEAT); such application will be made prior to the acceptance and signing of informed consent; and will last 40 minutes for

each patient. The data of each subject, in rows, will only have an identifier code of subject number, but in no case will names, surnames, ID number, e-mail address be registered, therefore, the subjects cannot be identified.

➢ *Statistical analysis*

A descriptive analysis of sociodemographic characteristics, the variables of chronic kidney disease, anxiety, depression and adherence to hemodialysis treatment in patients will be performed using frequency and percentages (qualitative variables) and measures of central tendency (quantitative variables), then a normality test will be performed using the Kolmogorov-Smirnov test and the Pearson test will be used to analyze whether anxiety, depression are related to adherence to hemodialysis treatment and to the time of chronic kidney disease. Finally, to verify whether men with chronic kidney disease have greater anxiety, depression and less adherence to treatment according to marital status, level of education and employment status, a Levene test (homoscedasticity) will be performed, with parametric assumptions. Therefore, for mean differences, the t-test for independent samples will be used for two groups. Statistical analyses will be performed using the SPSS version 25.0 statistical program.

## III. RESULTS

The results of the present research are supported by tables where the data obtained from the sample collection are presented, taking into account the objectives set out in the study, and then interpreted and contrasted with the state of the art.

***Table 2.*** Sociodemographic characteristics of the study population.

| **Items** | | **f** | **%** |
|---|---|---|---|
| Age | 18 To 30 Years | 1 | 0,3 |
| | 31 To 50 Years | 103 | 31,4 |
| | Over 51 Years Old | 224 | 68,3 |
| Genre | Male | 179 | 54,6 |
| | Female | 149 | 45,4 |
| Level of Education | Basic | 175 | 53,4 |
| | Baccalaureate | 96 | 29,3 |
| | Third Level | 53 | 16,2 |
| | Fourth Level | 4 | 1,2 |
| Marital Status | Single | 19 | 5,8 |
| | Free Union | 216 | 65,9 |
| | Married | 63 | 19,2 |
| | Divorced | 30 | 9,1 |
| Employment Status | Employee | 66 | 20,1 |
| | Unemployed | 121 | 36,9 |
| | Retired | 54 | 16,5 |
| | Independent | 87 | 26,5 |
| Time of illness | Less than 5 Years | 162 | 49 |
| | Más De 5 Años | 166 | 51 |
| Time on hemodialysis | 1 A 5 Años | 201 | 61,3 |
| | Más De 5 Años | 127 | 38,7 |
| Weekly Sessions | 3 Sesiones | 328 | 100 |
| Institution covering your treatment | MSP | 151 | 46 |
| | IESS | 177 | 54 |
| TOTAL | | 328 | 100 |

Of the total number of respondents, 328, the following frequencies and percentages were obtained. 0.3% (n=1) are between 18 and 30 years old; 31.4% (n=103) participants are 31 to 50 years old and 68.3% (n=224) are over 51 years old. 54.6% (n=179) are male and 45.4% (n=149) are female. Regarding the level of education, 53.4% (n=179) of the respondents have basic education, 29.3% (n=96) have high school education, 16.2% (n=53) have third level education and 1.2% (n=4) have fourth level education. According to the results of marital status, 5.8% (n=19) are single, 65.9% (n=219) are unmarried, married represent 19.2% (n=63) and divorced represent 9.1% (n=30).

According to the data on the employment status of the study participants, 20.1% (n=66) are public employees, 36.9% (n=121) are unemployed; retirees represent 16.5% (n=54) and self-employed are 26.5% (n=87). Forty-nine percent (n=162) have less than 5 years and 51% (n=166) have more than 5 years. According to the time they have been undergoing hemodialysis, 61.3% (n=201) have 1 to 5 years and 38.7% (n=127) already have more than 5 years.

In the opinion of 100% (n=328) of the participants, 3 sessions per week were carried out. Of these, 46.0% (n=151) had their treatment covered by the Ministry of Public Health and 54% (n=177) by the Ecuadorian Institute of Social Security.

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➢ *Measures of central tendency*

Next, the tables with the measures of central tendency are presented, where the description of the statistical measures that aim to summarize in a single value the data of State-State Anxiety, Trait-Anxiety (A-R), IDER. State-Trait Depression Inventory, and the therapeutic adherence scale with the measures of mean, median and mode.

Table 3. Measures of central tendency Anxiety-State Anxiety

| | **Mean** | **Median** | **Mode** |
|---|---|---|---|
| I feel calm | 2,44 | 2,00 | 2 |
| I feel safe | 2,67 | 3,00 | 3 |
| I am tense | 2,23 | 2,00 | 2 |
| I am dissatisfied | 2,11 | 2,00 | 2 |
| I feel comfortable (I am at ease) | 2,56 | 3,00 | 3 |
| I feel upset | 2,00 | 2,00 | 2 |
| I am now worried about possible future misfortunes | 2,00 | 2,00 | 2 |
| I feel rested | 2,23 | 2,00 | 2 |
| I feel distressed | 2,11 | 2,00 | 2 |
| I feel comfortable | 2,23 | 2,00 | 2 |
| I have confidence in myself | 3,11 | 3,00 | 3 |
| I feel nervous | 2,00 | 2,00 | 2 |
| I am uneasy | 2,00 | 2,00 | 2 |
| I feel very "tied down" (oppressed). | 2,89 | 3,00 | 3 |
| I am relaxed | 2,77 | 3,00 | 3 |
| I feel satisfied | 2,00 | 2,00 | 2 |
| I am concerned | 2,66 | 3,00 | 3 |
| I feel dazed and overexcited | 2,77 | 3,00 | 3 |
| I feel joyful | 2,23 | 2,00 | 2 |
| At this moment I feel good | 2,34 | 2,00 | 2 |

The statistical program was used to obtain the mean, median and mode ranges. The mean indicated by the survey participants was 2.11, which is the option quite a lot. The median and mode measures obtained a value of 2, which means that the participants indicated the option quite a lot.

Table 4. Measures of central tendency Anxiety - Trait (A-R)

| | **Mean** | **Median** | **Mean** |
|---|---|---|---|
| I feel calm | 2,56 | 3,00 | 3 |
| I get tired quickly | 2,22 | 2,00 | 2 |
| I feel like crying | 2,21 | 3,00 | 3 |
| I would like to be happy like others | 2,66 | 3,00 | 4 |
| I miss opportunities by not deciding soon | 2,55 | 3,00 | 3 |
| I feel rested | 2,34 | 2,00 | 2 |
| I am a calm, serene and serene person | 2,22 | 2,00 | 2 |
| I see that difficulties are piling up and I can't cope with them | 2,11 | 2,00 | 2 |
| I worry too much about unimportant things | 2,44 | 2,00 | 2 |
| I am happy | 2,67 | 2,00 | 2 |
| I tend to take things too seriously | 2,33 | 2,00 | 2 |
| I lack self-confidence | 1,99 | 2,00 | 2 |
| I feel secure | 2,45 | 2,00 | 2 |
| I tend not to face crises or difficulties | 2,90 | 3,00 | 3 |
| I feel sad (melancholic) | 1,88 | 2,00 | 2 |
| I am satisfied | 2,56 | 2,00 | 2 |
| I am haunted and bothered by unimportant thoughts | 2,22 | 2,00 | 2 |
| I am so affected by disappointments that I cannot forget them. | 1,88 | 2,00 | 2 |
| I am a stable person | 2,45 | 2,00 | 2 |
| When I think about current issues and worries, I become tense and agitated. | 2,55 | 3,00 | 3 |

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In the Anxiety- Trait (A-R) scale, the mean was 2.67, which is the option quite a lot. The median and mode measures obtained a value of 2, which means that the participants indicated the option quite a lot.

Table 5. Measures of central tendency Depression-State (D-E)

| | Mean | Median | Mean |
|---|---|---|---|
| I am cheerful | 2,23 | 2,00 | 2 |
| I am happy | 2,23 | 2,00 | 2 |
| I am enthusiastic | 2,23 | 2,00 | 2 |
| I feel energetic | 2,45 | 2,00 | 2 |
| I feel good | 2,23 | 2,00 | 2 |
| I am down | 2,33 | 2,00 | 2 |
| I am sad | 1,99 | 2,00 | 2 |
| I am sad | 1,77 | 2,00 | 1 |
| I feel unhappy | 1,99 | 2,00 | 2 |
| I feel energetic | 2,11 | 2,00 | 2 |

In the Depression-State (D-E) analysis, the mean was 2.45, which is the option quite a lot. The median and mode measures obtained a value of 2, which means that the participants indicated the option quite a lot.

Table 6. Measures of central tendency Depression - Trait (D-R)

| | Mean | Median | Mean |
|---|---|---|---|
| I feel happy | 2,34 | 2,00 | 2 |
| I enjoy life | 2,34 | 2,00 | 2 |
| I feel energetic | 2,56 | 2,00 | 2 |
| I am sad | 2,33 | 2,00 | 2 |
| I feel full | 2,23 | 2,00 | 2 |
| I don't feel like anything | 1,77 | 2,00 | 2 |
| I am down | 1,99 | 2,00 | 2 |
| I am down in the dumps | 1,88 | 2,00 | 2 |
| I am hopeful about the future | 2,44 | 3,00 | 3 |
| I feel unhappy | 1,88 | 2,00 | 1 |

In the Depression- Trait (D-R) analysis, the mean was 2.33, which is the fairly good option. The median and mode measures obtained a value of 2.

Table 7. Measures of Central Tendency Therapeutic Adherence Scale

| | Mean | Median | Mean |
|---|---|---|---|
| I take my medications on time | 2,21 | 2,00 | 2 |
| No matter how long the treatment is, I always take my medications at the indicated time. | 2,22 | 2,00 | 2 |
| I have my blood work done at the time indicated by the doctor. | 2,55 | 3,00 | 3 |
| If I have to follow a strict diet, I respect it. | 2,55 | 3,00 | 3 |
| I attend my appointments on time | 2,33 | 2,00 | 2 |
| I follow the doctor's recommendations in terms of being aware of any symptom that may affect my state of health. | 2,22 | 2,00 | 2 |
| I am willing to stop doing something pleasurable, such as not smoking or not drinking alcoholic beverages, if the doctor orders me to do so. | 1,88 | 2,00 | 1 |
| I eat only those foods that the doctor allows me to eat | 2,22 | 2,00 | 2 |
| If the doctor inspires confidence in me, then I follow the treatment. | 1,55 | 1,00 | 1 |
| After finishing the treatment, I go back to the clinic if the doctor tells me that it is necessary to verify my health status. | 1,67 | 1,00 | 1 |
| When I get the results of my clinical tests, I am surer of what I have and I adhere more closely to the treatment. | 2,10 | 2,00 | 2 |
| If my disease is not dangerous, I pay little attention to the treatment. | 3,12 | 3,00 | 3 |
| When I have too much work or too many things to do, I forget to take my medications. | 2,23 | 2,00 | 3 |
| When the symptoms disappear, I stop the treatment even though it is not finished. | 2,88 | 3,00 | 3 |
| If in a short time I see no improvement in my health, I stop the treatment. | 2,56 | 2,00 | 2 |
| If the treatment requires continuous exercise, I do it | 2,66 | 3,00 | 4 |
| In order for me to follow the treatment it is necessary for others to remind me to take my medication. | 2,78 | 3,00 | 3 |
| As recommended by the doctor, I have my clinical tests done periodically, even if I am not sick. | 2,10 | 2,00 | 1a |
| I am confident that the doctor will show that he/she knows about my illness. | 2,10 | 2,00 | 3 |
| If my illness is suspected to be serious, I do what I can to relieve myself. | 2,32 | 2,00 | 2 |
| Even if the treatment is complicated, I follow it | 2,32 | 2,00 | 2 |
| a. There are multiple modes. The smallest value is displayed. | | | |

In the analysis of the Therapeutic Adherence Scale, the mean was 2.10, which is the fairly good option. In the median and mode measures obtained a value of 2.

➢ *Normality test*

The normality test was used to determine whether the random sample has a normal distribution. The Kolmogorov-Smirnov test was used to test whether or not a set of data conforms to a normal distribution. It is similar in this case to the Shapiro Wilk test, but the main difference with the Shapiro Wilk test lies in the number of samples. While the Shapiro Wilk test can be used with up to 50 data, the Kolmogorov Smirnov test is recommended for more than 50 observations.

➢ *Pearson correlation*

In this study the Pearson correlation coefficient is used to study the relationship (or correlation) between anxiety, depression with adherence to hemodialysis treatment and with the time of chronic kidney disease (minimum interval scale). The coefficient obtained is a measure that gives information about the intensity and direction of the relationship.

Table 8. Correlation between anxiety and adherence

| | | **Anxiety** | **Adherence** |
|---|---|---|---|
| Anxiety | Pearson correlation | 1 | -,853** |
| | Sig. (bilateral) | | ,000 |
| | N | 328 | 292 |

Table 8 indicated that there is a statistically significant negative and strong negative relationship between anxiety and adherence.

Table 9. Correlation between Time of Illness and Depression

| | | **Time of Illness** | **Depression** |
|---|---|---|---|
| Time of illness | Pearson correlation | 1 | ,142** |
| | Sig. (bilateral) | | ,010 |
| | N | 328 | 328 |
| Depression | Pearson correlation | ,142** | 1 |
| | Sig. (bilateral) | ,010 | |
| | N | 328 | 328 |
| | | | |

The r value > 0 there is a positive correlation between time of illness and depression because they are directly correlated.

➢ *Levene homoscedasticity test*

To verify whether men with CKD have greater anxiety, depression and adherence to treatment according to marital status, educational level and employment status, a Levene test (homoscedasticity) will be performed, with parametric assumptions. Therefore, for mean differences, the t-test for independent samples will be used for two groups and the ANOVA test for three or more groups. Statistical analyses will be performed using the SPSS version 25.0 statistical program.

Table 20 and Table 21 show the result of the T-test to compare the means of the variables, that is, the comparison between the means of two independent populations.

Table 10. Analysis of summary measures of anxiety, depression and adherence.

| **Group statistics** | | | | | |
|---|---|---|---|---|---|
| | **Gender** | **N** | **Mean** | **Deviation** | **Deviation. Mean error** |
| Anxiety | Male | 179 | 47,27 | 1,517 | ,113 |
| | Female | 149 | 47,44 | 1,463 | ,120 |
| Depression | Male | 179 | 21,5642 | 3,48513 | ,26049 |
| | Female | 149 | 21,6040 | 3,51218 | ,28773 |
| Adherence | Male | 157 | 47,1338 | 11,00588 | ,87836 |
| | Female | 135 | 46,3778 | 10,64549 | ,91622 |

Table 11. Differences in averages

| | | Levene's test for equality of variances | | t-test for equality of means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | gl | Meaning. (bilateral) | Difference of means | Difference standard error | 95% confidence interval of the difference | |
| | | | | | | | | | Lower | Upper |
| Anxiety | Equal variances are assumed | ,093 | ,761 | -,982 | 326 | ,327 | -,162 | ,166 | -,488 | ,163 |
| | Equal variances are not assumed | | | -,985 | 319,020 | ,325 | -,162 | ,165 | -,487 | ,162 |
| Depression | Equal variances are assumed | ,039 | ,844 | -,103 | 326 | ,918 | -,03978 | ,38785 | -,80279 | ,72323 |
| | Equal variances are not assumed | | | -,102 | 314,414 | ,918 | -,03978 | ,38813 | -,80344 | ,72388 |
| Adherence | Equal variances are assumed | ,987 | ,321 | ,594 | 290 | ,553 | ,75598 | 1,27244 | -1,74841 | 3,26037 |
| | Equal variances are not assumed | | | ,596 | 285,993 | ,552 | ,75598 | 1,26924 | -1,74226 | 3,25422 |

It is determined that there are no statistically significant differences, see Table 11.

## VI. DISCUSSION

The present study addressed adherence, anxiety and depression associated with hemodialytic treatment in patients with chronic kidney disease. The findings were found in a sample of adults of both sexes, all of them with a diagnosis of chronic kidney disease residing in the province of Guayas.

The results obtained with respect to the sociodemographic characteristics of the study population. It is observed that a large percentage of the population is older than 51 years, 54% of the participants are male, the most frequent marital status is free union and according to the level of study with the highest percentage is basic education, it is also evident that there is a high level of unemployment, in this regard Sanchez1[3] associated with the lack of adherence to hemodialytic therapy, advanced age, gender, low educational level, low economic resources, employment situation are the most influential and triggers of therapeutic noncompliance.

According to the results of adherence to hemodialytic treatment in the patients included in the study in terms of therapeutic adherence, the follow-up of the items is always (66.8%) and moderate (55.5%), a situation that favors the medical treatment and the patients' state of health. This is due to the fact that all patients have treatment coverage from the Ecuadorian Institute of Social Security (66.8%), which reduces the economic cost of treatment and allows them to have access to it constantly. In this sense, it contrasts with the study conducted by Inga and Galvan who determined that 70% of hemodialysis patients still do not accept the treatment; therefore, refusal is the main cause of therapeutic inadequacy associated with other factors that stand out in the research [13].

The results of the relationship between sociodemographic and clinical characteristics, anxiety, depression and adherence to treatment in the study population were calculated using the Pearson coefficient, which shows that there is a negative correlation, that is, that anxiety and adherence to treatment are inversely correlated, in contrast to what Murillo, et al, anxiety has been consistently linked to cardiac problems, such as inflammatory processes and the acquisition of potentially harmful behaviors (such as smoking or a sedentary lifestyle), which means that it leads the patient to greater deterioration.[20] In contrast, the Pearson coefficient indicates that there is a positive correlation between the time of the disease and depression because they correlate in a direct sense. As indicated by the authors Salas and Fernandez18 , depression tops the list of mood disorders, increasing morbimortality in these patients compared to other disorders, and is reflected in the lack of therapeutic adherence, especially in the attendance to hemodialytic therapy sessions. Gómez[19] et al. mention that depressive states are also related to a greater number of hospital admissions, longer stays and increased mortality in the same context.

## V. CONCLUSIONS

The above allows us to conclude that adherence, anxiety and depression affect the male population with a minimal difference from the female population, with age over 51 years, basic education level, unemployed occupation and marital status of free union; the majority present only a favorable adherence, although some also presented depression.

The main limitation of the study was the difficulty in accessing the population in the health institutions, which complicated contact with the patients and limited data collection, resulting in the fact that the study participants were patients from the province of Guayas who had a tendency toward medium or high adherence. In this sense, it

would be convenient in future research to consider the effect of depression in non-dialyzed persons and persons in the terminal phase, since other levels of adherence to therapeutic treatment may be found.

By showing the association between depression and the time of the disease, the need for psychological care for this population studied is highlighted, in order to help them cope with the loss of health. Likewise, they need to identify to what extent health services and nursing staff take into consideration the emotional state of patients, anxiety and depression not only as a factor but also to investigate how it is related to therapeutic adherence; this is an essential aspect in health care that favors the patient's quality of life.

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