# The associations between demographic characteristics and depressionin hemodialysis patients

Leila Taghipour [1]   Sepehr Rasekhi [2]   Ali Akbar Hesam [1]   Hossein Hamadiyan [2]   Mohammad Amin Sepehri Oskooe [2]   Mohammad Mohajer Bastami [2]

MSc Student of Clionical Psychology [1] , Hormozgan University, Bandar Abbas, Iran. Medical Student [2] , Student Research Committee of Hormozgan, Hormozgan University of Medical Sciences, Bandar Abbas, Iran.

## Original Article

## Abstract

Correspondence:
Ali Akbar Hesam, MSc Student.
Hormozgan of Fertility and Inferility Research Center, Hormozgan University of Medical Sciences.
Bandar Abbas, Iran.
Tel:+98 76 33337104
Email:
aliakbar.hesam@yahoo.com

**Introduction:** Dialysis is a stressful process with several psychological and social problems that can lead to the expression of psychological disorders in patients. The aim of the present study was to investigate the relationshipsbetween the demographic variables and depression among the dialysis patients.

**Methods:** The present study is across-sectional observation that involved all of the patients in hemodialysis centerof Shahid Mohammadi hospital of Bandar Abbas in 2012. One hundred fourteen patients were selected based on the statistical methods.Beck's depression inventory (BDI) with 21 questions was used to collect the data. Statistics SPSS 19 software for Windows was used for the statistical analyses. A two sided $\alpha = 0.05$ was considered statistically significant.

**Results:** About 57.9% of the samples were males and 42.1% were females and 74.4% were single and 52.6% were married. Significant correlation $(P<0.01)$ was found between the variables of sex, age, marital status, level of education, and income level with depression. The results showed that there was a higher depression among female patients than the male ones and also in singles compared to married patients. Concerning the income variable it was found that those with lower incomes were suffering more from depression.

**Conclusion:** Our findings support the importance of demographic characteristics to determine the prevalence of depression in hemodialysis patients. Among demographic variables, sex, age, marital status, level of education, and income level were the most important predictors.

**Key words:** Hemodialysis, Depression, Patient

## Introduction:

A chronic disease is a multidimensional experience which leads to the disruption and disability of the individual in many aspects such as psychological, social, economical, etc. The chronic disease, by time and gradually leads to thechanges in the above mentioned aspects and continuation in

these attitudes will eventually lead to behavioral, emotional and social relation disorders (1). The chronic kidney insufficiency is progressive and irreversible destructionwithseveral physical and psychological consequences. The main treats are dialysis and kidney transplant (2). Patients with chronic and advanced kidney insufficiency who are under hemodialysis treatment have variable problems and radical changes in their life style that can affect their social and psychological performances, due to the multiple and complex medical treatments (3). Since treatment with hemodialysis is a long-term trend, these patients need to use a series of strategies in order to better cope with and manage their disease which otherwise causes problems including depression (4).

Depression, in stressful life events especially the long-term problems like some physical diseases, could get evident and could continue because of these stressors. The hemodialysis patients are often struggling with many psycho-social stressors and depression is one of their most common psychological problems due to the changes in their life style, the disease and also the treatment methods (5). Studies showed a high prevalence of psycho-social disorders among the hemodialysis patients (6). According to Nazemian et al, in relation to the rate of depression and anxiety in hemodialysis patients, 65.5% were suffering from depression, 51.4% from obvious anxiety and 49.7% had hidden anxiety (7). Mollahadi et al revealed that 63.9% of the hemodialysis patients were suffering from anxiety, 60.5% from depression, and 51.7% from stress (8). Statistics in Iran indicated that more than 60 thousands are dying annually from kidney diseases, worldwide. All the dialysis patients were 8500 in 2002, 24000 in 2008, and 32686 in 2012, this trend demonstates a rise of 14% in kidney diseased patients in the last 10 years in Iran (9).

This elevating trend required more care and studies in this issue. In addition, due to the high treatment costs of the dialysis patients serious harms (such as depression) are imposed to these patients and lead to their isolation, social resignation and frustration.Recognizing the factors related to depression in these patients looks necessary. Therefore, the present study was seeking an answer to this question whether there is a relation between the demographic variables (sex, age, marital status, level of education and income level) with depression in the hemodialysis patients?

## Methods:

### Patients and Enrollment

The present study is of the cross-sectional type. The study population includes all the patients under hemodialysis treatment at the hemodialysis center of Shahid Mohammadi hospital in Bandar Abbas in 2012.The inclusion criteria were at least 6 months of treatment with hemodialysis, and tendency to take part in the study; and the excluding criteria were include having a history of being affected by psychological disorders prior to their treatment with hemodialysis, the presence of mourning in the last 6 months, and the physical and mental disabilities.

### Sample Size

The sample size of the research was calculated 114 by the following formula: $= [DEFF*Np(1-p)]/ [(d^2/Z^2_{1-\alpha/2}*(N-1)+p*(1-p)]$, $p=50\%\pm8$, $d=8\%$, $DEFF=1$, with the confidence level of 95%. Thereafter, simple random sampling method was used in this study and 114 patients were selected as the study samples and were given the questionnaire.The sampling strategy was performed by assigning a number to each case and a table of random numbers to identify which subjects were to be selected.

### Study Protocol

All of the participants were explained about targets of research and methods of this study and also how to fill questionnaires.Thereafter, the questionnaires were distributed among participants andafter completing the questionnaires, all of them were collected and the incomplete ones or any missing and unclear parts were returned to patients for revision. In case of illiterate patients, an interviewer was reading the questions for them and then filled in the questionnaire. This study was approved by Ethics Committee of Hormozgan University of Medical Sciences and all personal information were kept confidential and those records which we were not allowed to review or participate in the study, were excluded.

### Study Instruments

A two part self reported questionnaire was used for data gathering. Part one was designed for demographic characteristics includingage, sex, level of education, income level and also the marital status. The second part of the questionnaire contained a Beck's depression inventory (BDI) questionnaire. This questionnaire consists of 21 items with graduated answers from little (grade 0) to high (grade 3) that addresses issues such as being able to work, guilt, sadness, sexual interest, concern with personal appearance, tiredness, etc. This self rating measure used to assess behavioral manifestations of depression having reliability between 0.82 and 0.86 using the Cronbach's alpha and the split-half methods, respectively and a validity of 0.67 with diagnostic criteria (10).

### Statistical Methods

To analyze data, SPSS 19 program was used. Baseline characteristics are presented as frequencies for categorical variables and mean±SD for continuous variables.The obtained data were statistically analyzed using T-test for quantitative data and Chi-square for qualitative data. For all comparisons, a two sided $\alpha = 0.05$ was considered statistically significant.

## Results:

As shown in table 1, 57.9% of the study population was consisted of males and 42.1% were females. In the male group, the highest frequency (28.9%) had mild depression, while in the female group, the highest frequency (31.6%) had the moderate depression.

Data analysis showed that the age of the participantsare in relation with the levels of depression. In the age group of 20-30 years of age, 5.3% were suffering from the mild depression. In the age group of 31-40 years, 3.5% were suffering from the moderate depression, while, 14.9% in the age group of 41-50 years, and 18.4% in the age group of $\geq 51$ years were suffering from the moderate depression.

**Table 1. The frequency and percentage of sex of the patients in relation to the levels of depression**

| | | | Sex | | Total |
| --- | --- | --- | --- | --- | --- |
| | | | Male | Female | |
| Level of depression | Without depression | Frequency | 4 | 4 | 8 |
| | | % | 3.5% | 3.5% | 7.0% |
| | Negligible | Frequency | 15 | 4 | 19 |
| | | % | 13.2% | 3.5% | 16.7% |
| | Mild | Frequency | 33 | 2 | 35 |
| | | % | 28.9% | 1.8% | 30.7% |
| | Moderate | Frequency | 7 | 36 | 43 |
| | | % | 6.1% | 31.6% | 37.7% |
| | Severe | Frequency | 4 | 2 | 6 |
| | | % | 3.5% | 1.8% | 5.3% |
| | Very severe | Frequency | 3 | 0 | 3 |
| | | % | 2.6% | 0% | 2.6% |
| Total | | Frequency | 66 | 48 | 114 |
| | | % | 57.9% | 42.1% | 100.0% |

**Table 2. The frequency and percentage of age of the patients in relation to the levels of depression**

| | | | Age | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- |
| | | | 20-30 | 31-40 | 41-50 | ≥51 | |
| Level of depression | Without depression | Frequency | 0 | 3 | 1 | 4 | 8 |
| | | % | .0% | 2.6% | .9% | 3.5% | 7.0% |
| | Negligible | Frequency | 3 | 0 | 9 | 7 | 19 |
| | | % | 2.6% | .0% | 7.9% | 6.1% | 16.7% |
| | Mild | Frequency | 6 | 1 | 5 | 23 | 35 |
| | | % | 5.3% | .9% | 4.4% | 20.2% | 30.7% |
| | Moderate | Frequency | 1 | 4 | 17 | 21 | 43 |
| | | % | .9% | 3.5% | 14.9% | 18.4% | 37.7% |
| | Severe | Frequency | 0 | 1 | 1 | 4 | 6 |
| | | % | .0% | .9% | .9% | 3.5% | 5.3% |
| | Very severe | Frequency | 0 | 0 | 0 | 3 | 3 |
| | | % | .0% | .0% | .0% | 2.6% | 2.6% |
| Total | | Frequency | 10 | 9 | 33 | 62 | 114 |
| | | % | 8.8% | 7.9% | 28.9% | 54.4% | 100.0% |

**Table 3. The frequency and percentage of the marital status of the patients in relation to the levels of depression**

| | | | Marital status | | Total |
| --- | --- | --- | --- | --- | --- |
| | | | Single | Married | |
| Level of depression | Without depression | Frequency | 0 | 8 | 8 |
| | | % | .0% | 7.0% | 7.0% |
| | Negligible | Frequency | 12 | 7 | 19 |
| | | % | 10.5% | 6.1% | 16.7% |
| | Mild | Frequency | 16 | 24 | 35 |
| | | % | 14.0% | 21.1% | 30.7% |
| | Moderate | Frequency | 19 | 19 | 43 |
| | | % | 16.7% | 16.7% | 37.7% |
| | Severe | Frequency | 4 | 2 | 6 |
| | | % | 3.5% | 1.8% | 5.3% |
| | Very severe | Frequency | 3 | 0 | 3 |
| | | % | 2.6% | .0% | 2.6% |
| Total | | Frequency | 54 | 60 | 114 |
| | | % | 47.4% | 52.6% | 100.0% |

**Table 4. The frequency and percentage of the level of income of the patients in relation to the levels of depression**

| | | | Income level | | Total |
| --- | --- | --- | --- | --- | --- |
| | | | < 500000 tomans | > 500000 tomans | |
| Level of depression | Without depression | Frequency | 1 | 7 | 8 |
| | | % | .9% | 6.1% | 7.0% |
| | Negligible | Frequency | 19 | 0 | 19 |
| | | % | 16.7% | .0% | 16.7% |
| | Mild | Frequency | 28 | 13 | 35 |
| | | % | 24.6% | 11.4% | 30.7% |
| | Moderate | Frequency | 30 | 7 | 43 |
| | | % | 26.3% | 6.1% | 37.7% |
| | Severe | Frequency | 6 | 0 | 6 |
| | | % | 5.3% | .0% | 5.3% |
| | Very severe | Frequency | 3 | 0 | 3 |
| | | % | 2.6% | .0% | 2.6% |
| Total | | Frequency | 87 | 27 | 114 |
| | | % | 76.3% | 23.7% | 100.0% |

**Table 5. The frequency and percentage of the level of education of the patients in relation to the levels of depression**

| | | | Level of Education | | | | | Total |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | | | Illiterate | Elementrary school | Guidance school | High school | Secondary school of higher | |
| Level of depression | Without depression | Frequency | 0 | 9 | 6 | 1 | 3 | 19 |
| | | % | .0% | 7.9% | 5.3% | .9% | 2.6% | 16.7% |
| | Negligible | Frequency | 6 | 9 | 4 | 16 | 0 | 35 |
| | | % | 5.3% | 7.9% | 3.5% | 14.0% | .0% | 30.7% |
| | Mild | Frequency | 8 | 8 | 8 | 18 | 1 | 43 |
| | | % | 7.0% | 7.0% | 7.0% | 15.8% | .9% | 37.7% |
| | Moderate | Frequency | 0 | 6 | 0 | 0 | 0 | 6 |
| | | % | .0% | 5.3% | .0% | .0% | .0% | 5.3% |
| | Severe | Frequency | 0 | 0 | 0 | 0 | 3 | 3 |
| | | % | .0% | .0% | .0% | .0% | 2.6% | 2.6% |
| | Very severe | Frequency | 0 | 9 | 6 | 1 | 3 | 19 |
| | | % | .0% | 7.9% | 5.3% | .9% | 2.6% | 16.7% |
| Total | | Frequency | 17 | 36 | 18 | 36 | 7 | 114 |
| | | % | 14.9% | 31.6% | 15.8% | 31.6% | 6.1% | 100% |

In term of depression, 47.4% of the study population were single and 52.6% were married. In the single's group, the highest frequency (16.7%) were suffering from the moderate level of depression, while in the married cases, the highest frequency (21.1%) showed mild depression.

Based on the table 4, 76.3% of thepatients were those patients with an income level of less than 500000 Tomans, and only 23.7% described an income of more than 500000 Tomans. In the former group, the highest frequency (26.3%) reported moderate level of depression, and in the latter group, the highest frequency with 11.4%

showed mild level of depression. In accordance to table 5, about 14.9% of the study population was illiterate, 31.6% were at the level of the elementary school, 15.8% at the level of the guidance school, 31.6% at the level of the high school, and only 6.1% were at the level of the secondary school studies or above.

**Table 6. The results of the Chi-square test in the study variables**

| Variables | Chi square | df | Sig |
|---|---|---|---|
| sex | 55.59 | 5 | 0.01 |
| age | 13.71 | 15 | 0.01 |
| Marital status | 13.54 | 5 | 0.01 |
| income | 28 | 5 | 0.01 |
| education | 90.15 | 20 | 0.01 |

Depending on the analytical result of the present study in the variable of sex, with the Chi-square value of 55.59, at α level of 99%, a significant relation is seen with depression. In the variable o age with the Chi-square value of 31.71% at α level of 99%, there is a significant relation with depression. In the variable of the marital status with the Chi-square value of 13.54 at α level of 99%, a significant relation is seen with depression. In the variable of income with the Chi-square value of 28 at α level of 99%, a significant relation is seen with depression. In the variable of education with the Chi-square value of 90.15 at α level of 99% a significant relation is seen with the depression. As it is seen in the above table, the demographic variables of sex, age, marital status, income and education had significant influence on depression among the dialysis patients.

## Conclusion:

The present study was conducted with the objective of studying the relationship between the cognitive variables on depression among the dialysis patients in the Shahid Mohammadi hospital in the Bandar Abbas. Psychological and emotional situation of patients are two main sources of self-efficacy which is a person's belief in his or her ability to succeed in a particular situation. This belief may determine the outcome of disease according to literature (11).

Analyses showed that in the male group, 28.9% were suffering from the mild level of depression,

while in the female group, 31.6% were suffering from the moderate level of depression. Results of the Chi-square test showed that there is a significant difference between the both groups of male and female at the depression levels. Therefore, it can be said that the level of depression among the dialysis patients is higher in females in comparison to males. This is in agree with majority of the similar and related investigations. It may be mainly due to the differences in their difficulty tolerance and some of the other psychological demands (12). In addition, it seems that this is because females are facing with more social stresses than males, especially when they are facing a physical illness. Therefore, sexuality is an influential variable on depression (13).

On the other hand, results of the Chi-square test indicated that patients with higher ages were more prone to depression. This is coincident with the findings of Stek et al. in 2014. They also reported that depression can be fatal in old ages when they feel lonely (14). Yohannes et al. documented that over 40% of older patients suffer from clinically significant depressive symptoms that may interfere in their daily activities (15). This difference can be mainly due to lack of social support. In fact, advancing age is often accompanied by loss of social support systems due to the death of a spouse or siblings, retirement, or relocation of residence (16).

In addition to the mentioned associations, it was found that singles were suffered more than married subjects from depression. The similar correlation was detected in the study conducted by Tabolli et al (17). In this regard, Yaka et al also described that singles were more likely to have depression (18).

Therefore, it can be said that the level of depression among the single hemodialysis patients was higher than the married patients. In contrast, some of the other researches illustrated the opposite relationship. The differences in the obtained results may be due to the variety of variables and differences in quality of marital life in different populations (19).

In accordance to Carter et al. (20), our investigation demonstrated that the dialysis patients with lower income were suffered more from depression, in compare with others. Recently, lots of authors focused on the adverse conditions of mental health in poor individuals of the

societies.They described that poverty can create and perpetuate poor health status (21). In this regard, Singh et al. (2013) identifies the major reasons of this interaction: poor nutrition, shelter, working conditions and health care costs and also erosive livelihood strategies (22).

The level of education was significantly associated with the frequency of depression in the study population. Analyses of the data indicated that the majority of the participants were illiterates, or at the levels of elementary, and guidance school. The illiterates were suffering from the higher levels of depression than those at the education levels of elementary and guidance schools. These are in line with previous investigations conducted, recently (23). The illiterates population of each society are more prone to mental health problems majorly due to wrong coping strategies (24). In addition, many people with reading problems feel significant shame and hide their inability. This embarrassment often felt by illiterate individuals may lead to social isolation and pose a psychological barrier to overcoming stressful environments (25).

In sum, the findings of present article are in conformity with Santoset al. (26) and Araujo et al. (27) asthey reported significant associations between physical illness, education, age and sex with the expression of depression symptoms in the patients under hemodialysis.

However, the present study had some limitations, of which we can mention the small number of samples, lack of studying and controlling other variables such as the background diseases including diabetes, etc., make the generalization of the findings of this study to some extent in doubt. Lack of precision and patience in answering the questions in the questionnaire could be mentioned as the other cases of limitation in the present study. Therefore, it is suggested to consider these items in further investigations.

## References:

1. Nichols K. Psychological therapy and personal crisis-the care of physically ill people. Psychology and Psychotherapy. 2015;14:183.

2. Fallahi S, Nabavizadeh F, Sadr SS, Alizadeh AM, Adeli S, Mahrevanian H, et al. The effects of Leptin on gastric ulcer due to physical and psychological stress: Involvement of nitric oxide and prostaglandin E2. Journal of Stress Physiology & Biochemistry. 2011;7(4):301-310.

3. Heidari Gorji MA, Davanloo AA, Heidarigorji AM. The efficacy of relaxation training on stress, anxiety, and pain perception in hemodialysis patients. Indian J Nephrol. 2014;24(6):356-361.

4. Kiossee V, Karathano S. Depression in patients with CKD: a person centered approach. Journal of Psychology & Psychotherapy. 2012;3:2161-2167.

5. Song MK, Ward SE, Hanson LC, Lin FC, Hamilton JB, Hladik G, et al. Psychological symptoms and end-of-life decision making confidencein surrogate decision-makers of dialysis patients. Nephrol Soc Work. 2012;36:23-28.

6. Moattari M, Ebrahimi M, Sharifi N, Rouzbeh J. The effect of empowerment on the self-efficacy, quality of life and clinical and laboratory indicators of patients treated with hemodialysis: a randomized controlled trial. Health and Qual Life Outcomes. 2012;10:115.

7. Kersten M, Kozak A, Wendeler D, Paderow L, Nübling M, Nienhaus A. Psychological stress and strain on employees in dialysis facilities: a cross-sectional study with the Copenhagen Psychosocial Questionnaire. J Occup Med Toxicol. 2014;9(1):4.

8. Nazemian F, Ghafari F, Pourghazneyn T. Evaluation of depression and anxiety in hemodialysis patients. Medical Journal of Mashhad University of Medical Sciences. 2008;51(3):171-176. [Persian]

9. Mollahadi M, Tayyebi A, Ebadi A, Daneshmandi M. Comparison between anxiety, depression and stress in hemodialysis and kidney transplantation patients. International Journal of Critical Care Nursing. 2010;2(4):9-10.

10. Einollahi B. Kidney transplantation in Iran. Iranian Journal of Medical Sciences. 2015;35(1):1-8.

11. Rao RM, Raghuram N, Nagendra H, Usharani M, Gopinath K, Diwakar RB, et al. Effects of an integrated yoga program on self-reported depression scores in breast cancer patients undergoing conventional treatment: A

randomized controlled trial. Indian Journal of Palliative Care. 2015;21(2):174.

12. Duggleby WD, Williams A, Holstlander L, Thomas R, Cooper D, Hallstrom L, et al. Hope of rural women caregivers of persons with advanced cancer: guilt, self-efficacy and mental health. Rural and Remote Health. 2014;14:62561.

13. Oquendo MA, Ellis SP, Greenwald S, Malone KM, Weissman MM, Mann JJ. Ethnic and sex differences in suicide rates relative to major depression in the United States. Am J Psychiatry. 2001;158(10):1652-1658.

14. Zietsch BP, Verweij KJ, Heath AC, Madden PA, Martin NG, Nelson EC, et al. Do shared etiological factors contribute to the relationship between sexual orientation and depression? Psychol Med. 2012;42(3):521-532.

15. Stek ML, Vinkers DJ, Gussekloo J, Beekman AT, van der Mast RC, Westendorp RG. Is depression in old age fatal only when people feel lonely? Am J Psychiatry. 2005;162(1):178-180.

16. Yohannes AM, Alexopoulos GS. Pharmacologic Treatment of Depression in Older Patients with COPD: Impact on the Course of the Disease and Health Outcomes. Drugs Aging. 2014;31(7):483-492.

17. Pine DS, Cohen E, Cohen P, Brook J. Adolescent depressive symptoms as predictors of adult depression: moodiness or mood disorder? Am J Psychiatry. 1999;156(1):133-135.

18. Tabolli S, Pagliarello C, Di Pietro C, Abeni D. Limited role of marital status in the impact of dermatological diseases on quality of life. Eur J Dermatol. 2012;22(5):672-677.

19. Yaka E, Keskinoglu P, Ucku R, Yener GG, Tunca Z. Prevalence and risk factors of depression among community dwelling elderly. Archives of gerontology and geriatrics. 2014;59(1):150-154.

20. Schmitz N, Kruse J, Kugler J. Disabilities, quality of life, and mental disorders associated with smoking and nicotine dependence. Am J Psychiatry. 2014;33(1):31-39.

21. Carter GC, Cantrell RA, Zarotsky V, Haynes VS, Phillips G, Alatorre CI, et al. Comprehensive review of factors implicated in the heterogeneity of response in depression. Depress Anxiety. 2012;29(4):340-354.

22. Patel V, Rodrigues M, DeSouza N. Gender, poverty, and postnatal depression: a study of mothers in Goa, India. Am J Psychiatry. 2002;159(1):43-47.

23. Singh JA, Lewallen D. OP0093 Income and Patient-Reported Outcomes (PROS) after Primary Total Knee Arthroplasty. Ann Rheum Dis. 2013;72:81-82.

24. Farr SL, Denk CE, Dahms EW, Dietz PM. Evaluating universal education and screening for postpartum depression using population-based data. Womens Health. 2014;23(8):657-663.

25. Bello ARS, Daoud SA, Baig MB. Coping strategies of Darfurians displaced women in Khartoum. Journal of Agricultural Extension and Rural Development. 2014;6(5):168-174.

26. Kim BS, Lee DW, Bae JN, Chang SM, Kim S, Kim KW, et al. Impact of illiteracy on depression symptomatology in community-dwelling older adults. Int Psychogeriatr. 2014;26(10):1669-1678.

27. Santos PR, Arcanjo FP. Social adaptability and substance abuse: Predictors of depression among hemodialysis patients? BMC Nephrol. 2013;14(1):12.

28. Araujo SM, de Bruin VM, Daher EdF, Almeida GH, Medeiros CA, de Bruin PFC. Risk factors for depressive symptoms in a large population on chronic hemodialysis. Int Urology and Nephrol. 2012;44(4):1229-1235.