



# Predictors of hope in Iranian patients undergoing hemodialysis

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## ABSTRACT

**Introduction:** Patients undergoing hemodialysis (HD) are more vulnerable to mental, physical and spiritual disorders. These disorders may have a significant impact on their treatment process and quality of life (QoL). Given the importance of some experiences in these individuals, such as daily spiritual experiences and life expectancy, evaluating their predictive role seems necessary.

**Objectives:** This study was conducted to determine the role of daily spiritual experiences and some demographic variables in predicting the level of hope among HD patients.

**Patients and Methods:** In this cross-sectional study, the predictive role of daily spiritual experiences and some demographic variables in the level of hope in 262 HD patients were evaluated. The demographic variables checklist, the Daily Spiritual Experiences Scale (DSES), and the Adult Hope Scale were employed for data collection.

**Results:** Analysis with multiple linear regression showed that the variables of gender, level of education, duration of diagnosis of renal failure, number of HD per week and daily spiritual experiences predicted 31% of the level of hope changes in HD patients.

**Conclusion:** Nurses and provincial health care providers can help HD patients to promote their spiritual wellbeing and hope. This can be achieved by applying a holistic care approach as well as emphasizing the spiritual aspect of care and its predictive demographic variables.

### Implication for health policy/practice/research/medical education:

In a cross-sectional study on 262 HD patients, we found that the majority of patients undergoing HD had high levels of spiritual experiences and hope. In addition, the findings indicated that the level of hope in the patients was influenced by some demographic variables and spiritual experiences.

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## Introduction

Chronic renal failure (CRF) has been a global health issue over the last few decades (1-3). In the United States, about 300 000 people have been diagnosed with CRF. In Iran, it has been estimated that 1200 to 1600 new CRF cases occur each year (4). CRF is characterized by kidney damage or a gradual decrease in kidney function for three or more months. Chronic kidney disease has many consequences such as decreased quality of life (QoL), increased health care costs, and premature death. In addition, CRF could progress to end-stage renal disease (ESRD) if not treated. ESRD is a progressive and irreversible impairment of

kidney function (5-8).

One of the most effective renal replacements therapies is dialysis. Among the two methods of hemodialysis (HD) and peritoneal dialysis (PD), HD is the most common method used worldwide (9). The purpose of HD is to remove uremic waste products and excess fluid from the body (10).

HD, similar to other medical interventions, is associated with complications and unintended consequences. The most common complications include hypotension, disequilibrium syndrome, muscle cramping, chest pain, back pain, anemia and fatigue. Air embolism and

hemolysis are among the serious complications that rarely occur (11). In addition to experiencing numerous physical changes, these patients encounter many challenges and psychological stresses which can result in devastating consequences on their mental health (12).

Among the various psychological variables, hope is one of the most important influential variables in patients with HD. Hope is a strong driving force that can lead patients with chronic disorders, such as patients with CRF, to recovery, health promotion, and a better lifestyle (11). Hope is a trait that includes having goals, having the power of planning, having the will to achieve goals, being able to pay attention to the obstacles, having the ability to overcome obstacles and having the ability to promote and increase life performance (11,13).

Hope is a healing, multidimensional, dynamic and powerful factor that plays an important role in coping with difficulties (14). According to Snyder et al, hope is not a passive emotion that only appears in the dark occasions of life. Hope is a cognitive process that drives individuals to actively pursue their goals and includes positive attitudes towards the future. It is optimism combined with a more active effort to achieve a positive outcome in the future (15,16). Following the 'hope theory' by Snyder et al, several studies evaluated the relationship between hope and various psychological variables. One of these psychological variables is daily spiritual experiences (17).

Spirituality is defined as the search to understand the answers that relate to the foundation of existence and life. Finding answers that are related to the meaning of life and most importantly, involve an inner connection with the transcendent and with the Almighty/God. One of the functions of spiritual beliefs and spirituality is to help individuals in times of crisis. Faith and spirituality are among the effective factors in adaptation during stressful conditions and are associated with having a greater ability to overcome difficult and unexpected circumstances. The spiritual belief of individuals affects how they interpret events and facilitates the process of adaptation and acceptance of events (2).

Suffering from debilitating and chronic diseases drives individuals towards challenging questions about the meaning and purpose of life. Therefore, spirituality can increase the patient's ability to cope with these conditions and increase the recovery speed (17). Several studies have been conducted on the relationship between spirituality and physical and mental health, or the enhancement of adaptation. Alshraifeen et al concluded that spiritual health has become an important factor in predicting the QoL of HD patients (18). In another study, Zhang et al reported that HD patients who had higher levels of hope had better spiritual wellbeing (17).

Patients undergoing HD are more vulnerable to mental, physical and spiritual disorders. Consequently, these will have a significant impact on their treatment process and

QoL. Given the importance of some experiences in these individuals, such as daily spiritual experiences and hope, evaluation of their predictive role seems necessary.

### Objectives

The number of patients with CRF and utilization of HD is increasing worldwide. In addition, the physical and mental health of these individuals is important. However, there are insufficient studies regarding the daily spiritual experiences and hope in patients with HD. Therefore, the present study aimed to evaluate the role of daily spiritual experiences and some demographic variables in predicting the level of hope in patients with HD in Qazvin, Iran.

### Patients and Methods

#### Study design

This cross-sectional study evaluated the predictive role of daily spiritual experiences and some demographic variables in the level of hope in patients with HD.

#### Research population and sample

All patients who were referred to the HD wards of the Booali Sina, Velayat and Razi hospitals, Qazvin, Iran in 2020 were included in this study. The participants were selected through a convenience sampling method based on inclusion and exclusion criteria. Based on the study of Mahboub et al (19), and considering  $\alpha = 0.05$ ,  $\sigma = 12.7$ ,  $d = 0.12 \times 12.7 = 1.524$ , the sample size was calculated to be 266.

$$n = \frac{Z^2 \cdot \sigma^2}{d^2} = \frac{1.96^2 \cdot 12.7^2}{1.524^2} = 266$$

The inclusion criteria included age of at least 18 years, history of HD for at least 6 months, HD at least twice a week, being conscious and being willing to participate in the study. The exclusion criteria included the presence of mental disease, a history of suicide, taking psychiatric drugs, having an acute physical condition and having experienced severe stress that had disrupted the psychological balance within the past month.

#### Data collection tools

The demographic variables checklist, the Daily Spiritual Experiences Scale (DSES) and the Adult Hope Scale were applied for data collection.

#### The demographic variables checklist

The demographic variables checklist included gender, age, level of education, marital status, employment, income status, residence, duration of diagnosis of CRF, cause of renal failure, number of HD per week, history of kidney transplantation (KT) and underlying diseases. The validity of the items was verified by the Nursing Professors of the Critical Care Unit Department.

### The Daily Spiritual Experiences Scale

Underwood and Teresi designed this scale to assess the daily connection experiences of the individuals with a higher force (Allah, God) in daily life and also the experiences of interaction with the transcendent beyond the material world. It consists of 16 items which are answered on a Likert-type scale. The scores range between 6 (many times a day), 5 (every day), 4 (most days), 3 (some days), 2 (once in a while) and 1 (never or almost never). The maximum and minimum scores are 96 and 16, respectively. Higher and lower scores indicate high and poor levels of experience, respectively (20). The Indonesian version of the DSES questionnaire (16-item) had good internal consistency with Cronbach's alpha of 0.86 (21).

### The Adult Hope Scale

This scale was designed by Snyder (1995) to evaluate the level of hope in individuals more than 15 years of age. It is a self-report scale consisting of 12 items in which the participants respond to each item using a 4-point Likert scale. A score of 4 indicates 'definitely true', 3 indicates 'somewhat true', 2 indicates 'somewhat false', and 1 indicates 'definitely false'. In addition, the minimum and maximum scores are 12 and 48, respectively and higher and lower scores indicate more and less hope, respectively. A study on adults by DiGasbarro et al reported well to excellent validity and reliability for this scale (22).

### Data collection process

The researcher was referred to the Nursing Office of the Boali Sina, Velayat and Razi hospitals and submitted the study authorization. Later on, the researcher went to the HD wards and coordination with the head nurses was conducted for sampling. After providing explanations about the questionnaires and obtaining written informed consent, 262 participants responded to the questionnaires willingly.

### Data analysis and evaluation

The data of this study were analyzed using the SPSS software (version 24, Armonk, NY: IBM Corp) and the Stata software (version 12, Stata Corp LP, College Station, TX, USA). Descriptive statistics including frequency, mean and standard deviation (SD) were employed to describe the demographic variables of the participants. Inferential statistics (Pearson's test) and linear regression were employed to evaluate the relationship between daily spiritual experiences and hope with demographic variables. Multiple linear regression was applied to examine the predictive factors of hope. The variance inflation factor (VIF) index was conducted to assess the collinearity of predictor variables and the value of this index was less than 1.5 for all variables. The significance level for all tests was considered as  $P < 0.05$ .

## Results

### Socio-demographic characteristics of the hemodialysis patients

In this study, 266 HD patients with a mean age of  $60.35 \pm 14.65$  years were included. The majority of the participants were married ( $n = 197$ , 75.5%), had a level of education under diploma ( $n = 116$ , 45.5%) and were housewives ( $n = 80$ , 30.5%; Table 1). The mean and SD of the overall scores of the DSES and the Adult Hope Scale were  $80.86 \pm 13.07$  and  $40.13 \pm 4.55$ , respectively.

### Univariate Analysis and Simple Linear Regression

The results of the analysis with simple linear regression on the relationship between the demographic variables and daily spiritual experiences with the level of hope are shown in Table 2. Based on these results, a significant relationship was observed between gender, marital status, level of education, employment, duration of diagnosis of renal failure, monthly income and daily spiritual experiences with the level of hope. The mean score of hope was significantly higher in the male gender, married individuals, freelance patients with higher education, shorter duration of diagnosis of renal failure, those with a higher income and those with a higher score of daily spiritual experiences.

**Table 1.** Socio-demographic characteristics of the patients undergoing hemodialysis

Variable	No.	Percent	
Gender	Female	95	36.5
	Male	165	63.5
Marital status	Single	20	7.7
	Married	197	75.5
	Divorced	44	16.9
Education	Illiterate	90	34.5
	Under the diploma	116	44.5
	Diploma	36	13.8
	Academic	19	7.3
Occupational status	Unemployed	65	24.8
	Employed	8	3.1
	House wife	80	30.5
Residence status	Free	34	13
	Retired	75	28.6
	Urban	187	71.6
Duration of dialysis (y)	Rural	74	28.4
	3-5	140	54.5
	6-10	70	27.2
Times of HD/per week	More than 11	47	18.3
	2	34	13.2
History of KT	3	224	86.8
	Yes	25	9.5
	No	237	90.5

Abbreviations: HD, Hemodialysis; KT, Kidney transplantation.

**Table 2.** Simple linear regression of the relationship between different variables and the level of hope in patients undergoing hemodialysis in Qazvin, Iran

Variable		Mean $\pm$ SD	Unstandardized Beta	Standardized Beta	P value
Gender	Female	38.96 $\pm$ 4.64	Reference	-	-
	Male	40.76 $\pm$ 38.4	1.81	0.19	0.002
Marital status	Single	38.25 $\pm$ 3.99	Reference	-	-
	Married	40.58 $\pm$ 4.51	2.34	0.22	0.027
	Divorced	39.16 $\pm$ 4.53	0.91	0.08	0.452
Education	Illiterate	39.26 $\pm$ 4.19	Reference	-	-
	Under the diploma	40.19 $\pm$ 4.75	0.93	0.10	0.142
	Diploma	41.36 $\pm$ 4.44	2.11	0.16	0.019
	Academic	41.47 $\pm$ 4.61	2.22	0.13	0.053
Occupational status	Unemployed	39.94 $\pm$ 5.09	Reference	-	-
	Employed	40.50 $\pm$ 4.44	0.56	0.02	0.738
	Housewife	38.98 $\pm$ 4.21	-0.95	-0.10	0.205
	Free	42.00 $\pm$ 3.25	2.06	0.15	0.031
	Retired	40.64 $\pm$ 4.67	0.70	0.07	0.356
Residence status	Urban	40.00 $\pm$ 4.70	Reference	-	-
	Rural	40.43 $\pm$ 4.17	0.43	0.04	0.491
Insurance status	Yes	40.14 $\pm$ 4.64	Reference	-	-
	No	40.19 $\pm$ 4.28	0.05	0.004	0.947
Duration of dialysis (y)	3-5	40.53 $\pm$ 4.19	Reference	-	-
	6-10	38.68 $\pm$ 4.87	-1.84	-0.18	0.005
	More than 11	41.02 $\pm$ 4.49	0.49	0.04	0.515
Times of HD per week	2	38.82 $\pm$ 4.78	Reference	-	-
	3	40.33 $\pm$ 4.47	1.51	0.11	0.071
History of KT	Yes	40.80 $\pm$ 4.83	Reference	-	-
	No	40.06 $\pm$ 4.52	-0.74	-0.05	0.442
Monthly income (million Toman)	No income	39.37 $\pm$ 4.94	Reference	-	-
	1	40.50 $\pm$ 4.28	1.13	0.10	0.150
	2	40.18 $\pm$ 4.43	0.81	0.08	0.272
	3	39.79 $\pm$ 4.19	0.42	0.03	0.659
	More than 3	42.77 $\pm$ 3.12	3.40	0.21	0.002
Number of children	None	38.92 $\pm$ 4.51	Reference	-	-
	1	39.96 $\pm$ 6.22	1.03	0.07	0.421
	2	40.67 $\pm$ 4.77	1.75	0.13	0.132
	More than 2	40.19 $\pm$ 4.28	1.26	0.13	0.184
Living companions	Living alone	39.38 $\pm$ 5.37	Reference	-	-
	Living with family members	40.19 $\pm$ 4.49	0.80	0.05	0.473
Age	r=0.40		0.004	0.014	0.827
Score of daily spiritual experiences	r=0.40		0.14	0.40	<0.001

Abbreviations: HD, Hemodialysis; KT, Kidney transplantation.

### Multiple linear regression

The results of the analysis with multiple linear regression using the backward elimination method on the predictive role of daily spiritual experiences and the demographic variables on the level of hope are shown in Table 3. According to the results in the adapted model, the variables of gender, level of education, duration of diagnosis of renal failure and number of HD per week along with the variable of daily spiritual experiences were significant predictors of the level of hope in patients undergoing HD.

Those patients that had higher daily spiritual experiences reported higher scores of hope. The male patients that had a higher level of education (compared to illiterate patients) and underwent HD three times a week (compared to those who underwent HD twice a week) reported a higher scores of hope. In contrast, patients with a diagnosis of renal failure within 6 to 10 years reported a lower mean score of hope compared to those with a diagnosis of renal failure within 3 to 5 years. These variables were overall able to predict 31% of changes in the levels of hope.

**Table 3.** Multiple linear regression of the predictors of the level of hope in patients undergoing hemodialysis in Qazvin, Iran

Variable		Unstandardized Beta	95% CI for beta	Standardized Beta	P value
Gender	Female	Reference	-	-	-
	Male	1.53	(0.47, 2.59)	0.16	0.005
Education	Illiterate	Reference	-	-	-
	Under the diploma	1.11	(0.02, 2.21)	0.12	0.047
	Diploma	2.64	(1.02, 4.26)	0.20	0.001
	Academic	2.81	(0.73, 4.89)	0.16	0.008
Duration of dialysis (y)	3-5	Reference	-	-	-
	6-10	-2.14	(-3.27, -1.01)	-0.21	<0.001
	More than 11	0.43	(-0.91, 1.76)	0.04	0.527
Times of HD per week	2	Reference	-	-	-
	3	1.81	(0.30, 3.31)	0.13	0.019
Score of daily spiritual experiences	-	0.15	(0.12, 0.19)	0.45	<0.001

Abbreviations: HD, Hemodialysis; CI, Confidence interval .

## Discussion

This study evaluated the predictive role of daily spiritual experiences and some demographic variables in the level of hope among HD patients. The results of this study showed that HD patients had high spiritual experiences and hope. Zhang et al, reported that HD patients had high levels of hope (17). In addition, several studies reported high spiritual scores among HD patients (23-25). Bovero et al also reported moderate-to-high levels of spiritual experiences among cancer patients (20).

Contrary to the results of the present study, Nisak et al and Musa et al reported low levels of hope and low scores of spiritual experiences in patients undergoing HD patients, respectively (11,24). Contradictory results regarding the level of daily spiritual experiences and hope among different patients can be due to the impact of these concepts on various individuals and also the social, cultural and economic variables. However, in the present study, the level of spiritual experiences and hope was high among HD patients in Qazvin, Iran.

Analysis with simple linear regression showed that the patients with certain characteristics had a higher level of hope. These characteristics included the male gender, married status, freelance patients with higher education, shorter duration of diagnosis of renal failure, higher income and a higher score of daily spiritual experiences. In addition, the results of the multiple linear regression showed that the variables of gender, level of education, duration of diagnosis of renal failure, number of HD per week, and daily spiritual experiences predicted 31% of the life expectancy changes in patients undergoing HD. The male patients that had a higher level of education, underwent HD three times/week, had a diagnosis of renal failure within 3 to 5 years and had a higher level of daily spiritual experiences reported higher levels of hope.

Zhang et al also found a positive and significant

relationship between spirituality and hope among HD patients (17). In addition, Rajendran et al and Nierop-van Baalen et al concluded that the level of hope in cancer patients increases with an increase in their spirituality and spiritual wellbeing. Therefore, by increasing daily spiritual experiences, patients became more hopeful about life and the future (26,27). On one hand, experts believe that spiritual experiences and beliefs play an important role in the physical and mental health of individuals. These experiences increase the level of hope, have a positive effect on reducing stress, help in the proper management of stressful events and can facilitate the time of stress and crisis. On the other hand, individuals who have a higher level of spiritual experiences believe that these experiences act as sedatives, make them more hopeful about life and its events, raise their hopes and feelings for each other and significantly reduce the negative emotions such as frustration, anger and emptiness (17,18).

Other studies have evaluated the relationship between demographic variables and the level of hope. For example, Çitlik Sarıtaş et al reported that those patients undergoing HD who were married and literate had higher levels of hope and QoL (2). Baczevska et al also reported that cancer patients that were married had higher levels of hope (28). In another study on patients who underwent cardiac surgery, Bjørnnes et al concluded that individuals who were married, educated and had good clinical conditions had higher levels of hope (29). Additionally, Mahendran et al reported that cancer patients who were married, educated, employed, had a high income and were in the early stages of the disease had more levels of hope (30).

Contrary to the results of the present study, a study by Baczevska et al on cancer patients revealed that men who were educated and had a high income had lower levels of hope (28). In addition, Nierop-van Baalen et al and Davis et al found no significant relationship between the

demographic and clinical variables and the level of hope in cancer patients (26,31). Liu et al found no significant relationship between gender, marital status, education status and the course of disease with the level of hope in patients with CRF (32). Since most of these studies have been conducted on HD patients, differences in the results may be due to the individual, social, economic and cultural differences in different societies.

### Conclusion

The results of the present study showed that the majority of patients undergoing HD had high levels of spiritual experiences and hope. In addition, the findings indicated that the level of hope in the patients was influenced by some demographic variables and spiritual experiences.

### Limitations of the study

This study is conducted in a single city, our results however require further investigation by multi-centric studies.

### Authors' contribution

SZH and SMZ were the principal investigators of the study. SZH, SMZ, MR, FR and AR prepared the concept and design. SZH and SMZ revisited the manuscript and critically evaluated the intellectual contents. All authors participated in preparing the final draft of the manuscript, revised the manuscript and critically evaluated the intellectual contents. All authors have read and approved the content of the manuscript and confirmed the accuracy or integrity of any part of the work.

### Conflicts of interest

The authors declare that they have no conflict of interest.

### Ethical issues

This study follows the principles of the Declaration of Helsinki and its later amendments. It was also approved by the Ethics Committee of Qazvin University of Medical Sciences, Qazvin, Iran (Ethical Code: IR.QUMS.REC.1399.102). All participants were informed about the study aims, procedures and questionnaires. They were also assured about the confidentiality and anonymity of their information. After obtaining written informed consent, 262 participants responded to the questionnaires willingly. The participants could leave the study whenever they desired and the research results would be available to them. Besides, ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors. Written informed consent was obtained from all of the study participants.

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