



Predictors of Happiness Among Hemodialysis Patients in Qazvin-Iran

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Received 2023 August 1; Revised 2023 December 25; Accepted 2024 March 8.

Abstract

Background: The enhancement of happiness in patients undergoing hemodialysis is positively associated with improved physical and mental health outcomes.

Objectives: This study was conducted to identify predictive factors of happiness among a group of Iranian hemodialysis patients.

Methods: In 2021, a descriptive study was carried out involving 200 hemodialysis patients from a center in Qazvin province, Iran. The census method was utilized to select eligible patients. Data collection was conducted using a socio-demographic checklist, the Oxford Happiness Questionnaire, and Snyder's Hope Scale. A multivariate regression model was employed to ascertain the predictors of happiness.

Results: The average age of the patients was 59.23 ± 14.43 , with an age range from 18 to 86 years. The majority were male ($n = 122$, 61.0%) and married ($n = 134$, 67.0%). A significant portion of the patients (69%, $n = 138$) reported moderate levels of happiness. The study also discovered that educational level ($\beta = 0.248$, $P \leq 0.001$), marital status ($\beta = -0.268$, $P \leq 0.001$), adequacy of hemodialysis ($\beta = 0.268$, $P \leq 0.001$), and hope ($\beta = 0.231$, $P \leq 0.001$) were significant predictors of happiness in patients undergoing hemodialysis.

Conclusions: The findings indicate that the majority of hemodialysis patients in Qazvin experience a moderate level of happiness. Factors such as hope, educational level, marital status, and adequacy of hemodialysis were linked to their happiness. These insights can inform health strategies developed by decision-makers aimed at enhancing the happiness of this patient group.

Keywords: Happiness, Hemodialysis, Hope, Chronic Kidney Disease, Hemodialysis Adequacy

1. Background

Chronic kidney disease (CKD) is a progressive and irreversible decline in renal function (1). Worldwide, the prevalence of CKD is estimated at 242 per one million people, with an annual increase of about 8% (2). In Iran, Dehghani et al. found that among 9781 participants aged 30 to 73 years old, the prevalence of CKD was 27.5% (3). Hemodialysis stands as the most common form of kidney replacement therapy globally (4). Approximately 90% of patients with CKD rely on dialysis to sustain life (5). The dialysis process significantly impacts patients' physical and psychological well-being and daily

functioning (6). Happiness appears to play a key role in managing the complications of chronic illnesses (7).

Happiness, a crucial aspect of mental health, significantly influences personality development (8). It encompasses a range of emotions and cognitive assessments of life, reflecting the extent to which an individual views their quality of life positively (9). Happiness is vital for effectively dealing with daily challenges and has numerous benefits (10), including a positive outlook on life, enhanced self-concept, increased vitality, psychological well-being, and improved social and physical performance (11).

Hemodialysis patients often face various physical and psychological challenges in their daily lives (12).

Previous research has shown positive associations between higher levels of subjective happiness and increased life satisfaction, a sense of humor, and reduced depression among these patients (13). Mehrabi and Ghazavi noted a significant influence of happiness on stress, anxiety, and depression in hemodialysis patients (14). Furthermore, studies have indicated that individuals with higher happiness levels tend to display greater creativity, adaptability, and hopefulness (15, 16).

Hope plays a crucial role in helping patients with chronic diseases adapt and persevere (17). It acts as a buffer, mitigating the impact of psychological difficulties on quality of life, with more hopeful individuals experiencing less anxiety and a better quality of life (18). For patients undergoing hemodialysis, hope for the future can improve various aspects of their quality of life (19). Snyder highlighted that fostering hope is an effective strategy for improving the quality of life of those living with chronic illnesses (20). Hope motivates patients to adhere to their treatment plans, including invasive procedures, lifestyle changes, and ongoing painful therapies (21).

Previous studies examining the factors correlated with happiness among hemodialysis patients have yielded contradictory findings. While some research has indicated no significant associations between happiness and clinical or sociodemographic variables, other studies have identified significant relationships between happiness and factors such as age, clinical work experience, gender, and marital status (17, 22).

2. Objectives

Given the disparity and mixed outcomes in existing literature, this study was initiated to uncover predictors of happiness in this patient demographic, aiming to illuminate an area in need of further exploration.

3. Methods

3.1. Study Design

This descriptive and cross-sectional study was conducted to identify predictive factors of happiness among hemodialysis patients.

3.2. Study Setting

The study took place in the dialysis department of Bu-Ali Sinai Hospital in Qazvin, located in the northern part of Iran. As the largest referral center in the province, this dialysis center has 40 active beds and serves 846

hemodialysis patients of all ages from various parts of Qazvin province.

3.3. Participants

Two hundred patients from the dialysis department of Bu-Ali Sinai Hospital were selected via a census sampling method based on specific inclusion and exclusion criteria. Participants were required to be willing to participate, aged over 18 years, and have been undergoing hemodialysis for a minimum of six months. Patients with psychological issues, as noted in their medical records, were excluded.

3.4. Sample Size

With a type I error of 0.05 (confidence level of 95%) and a type II error of 0.1, the sample size was determined using the following formula, and accounting for a potential non-response rate of 10%, the final sample size was established at 200.

$$n = \frac{\left(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2}{w^2} + 3 = \frac{(1.96 + 1.28)^2}{(-0.24)^2} + 3 = 185$$

3.5. Instruments

Data collection employed a demographic and clinical characteristics questionnaire, the Oxford Happiness Questionnaire, and Snyder's Hope Scale. The demographic and clinical characteristics checklist covered variables such as age, gender, living arrangement, educational level, marital status, employment status, financial status, frequency of dialysis per week, KT/V (dialysis adequacy), and history of hypertension, diabetes mellitus, and kidney transplantation. This questionnaire was developed based on existing literature. Face and content validity were assessed by 12 academic members from the critical care department of Qazvin University of Medical Sciences.

The parameter Kt/V measures the efficacy of a hemodialysis session (dialysis adequacy) by identifying the effective removal of a specific solute (clearance K) resulting from a given treatment (characterized by time t) in a patient (with a specific volume of distribution V for the solute). The Daugirdas formula was employed for Kt/V calculation in this research (23).

The Oxford Happiness Questionnaire, developed by Hills and Argyle (24), assesses an individual's happiness through 29 items. Responses are provided on a four-

point Likert scale, ranging from a (0) to d (25), with the total score on the questionnaire ranging from 0 to 87. Scores between 40 and 42 are considered indicative of happiness. The psychometric properties of this questionnaire have been validated in a previous study in Iran (26).

Snyder's Hope Scale, developed by Snyder et al. in 1991 (27), evaluates hope in individuals aged over 15 years. It includes 12 items, answered on a five-point Likert scale from totally disagree to totally agree. The scale has two subscales: agency (items 2, 9, 10, and 12) and pathway (items 1, 4, 7, and 8) thinking. Items 3, 5, 7, and 11 serve as distractors to obscure the scale's content. Scores range from 8 to 64, with higher scores indicating greater levels of hope. The scale has been validated for use in Persian (28).

3.6. Data Collection

Data were collected from April to May 2021. The main researcher, along with two trained assistants, distributed questionnaires among eligible patients across all weekdays and different shifts, during hemodialysis sessions. Researchers answered any questions from patients at the time of completing the questionnaires, which were then collected.

3.7. Statistical Analysis

Data analysis was conducted using SPSS 20.0. Descriptive statistics, including means and standard deviations (SD) for quantitative data and frequencies and percentages for qualitative data, were utilized. The Pearson correlation coefficient and Spearman's correlation were used to identify variables associated with happiness for continuous and categorical variables, respectively. Univariate regression models were initially run to determine predictor factors of happiness and significant variables were subsequently included in a multivariate regression model. The significance level was set at $P < 0.05$.

3.8. Ethical Considerations

After discussing the study's aims and sampling methods with the nurse managers of the selected hospital, the necessary permissions were obtained. Sampling permission was given to the head nurse, along with the required explanations. Ethical approval was granted by the Ethics Committee of Qazvin University of Medical Sciences (IR.QUMS.REC.1399.516).

4. Results

In this study, the average age of participants was 59.23 years, with a standard deviation of 14.43, and ages ranged from 18 to 86 years. The majority of participants were male ($n = 122$, 61.0%) and married ($n = 134$, 67.0%). Over one-third of the participants were illiterate ($n = 72$, 36.5%), and more than half reported having a low financial status ($n = 105$, 52.5%). Hypertension was prevalent among the majority ($n = 164$, 82.0%), and 60.5% ($n = 121$) did not achieve satisfactory hemodialysis adequacy. The participants' demographic characteristics are detailed in Table 1.

Table 1. Participants' Demographic Characteristics

Variables and Categories	Values ^a
Sex	
Female	78 (39.0)
Male	122 (61.0)
Living arrangement	
Alone	20 (10.0)
With family	180 (90.0)
Educational level	
Illiterate	72 (36.5)
Under diploma	77 (38.5)
Diploma and higher	50 (25.0)
Financial status	
Poor	105 (52.5)
Average	66 (33.0)
Good	29 (14.5)
Employment status	
Unemployed	51 (25.5)
Employed	9 (4.5)
Retired	42 (21.0)
Housewife	61 (30.5)
Nongovernmental	37 (18.5)
Marital status	
Single	18 (9.0)
Married	134 (67.0)
Widowed	48 (24.0)
Number of dialysis (per week)	
Twice	10 (5.0)
Three times	190 (95.0)
Hypertension	
No	36 (18.0)
Yes	164 (82.0)
Diabetes mellitus	
No	83 (51.5)
Yes	117 (58.5)
Kt/V	
No	121 (60.5)
Yes	79 (39.5)

^a Values are expressed as No (%).

According to the findings, most respondents had moderate levels of happiness (n = 138, 69%), while only 18.5% (n = 37) experienced high or very high levels of happiness. Additionally, 12.5% (n = 25) of the patients reported low levels of happiness. The average happiness score was 33.16, with a standard deviation of 10.64.

4.1. Correlated Factors of Happiness

To examine the relationships between variables, both Pearson correlation coefficient and Spearman's correlation analyses were conducted. The results of these analyses are presented in Table 2.

Table 2. Associations of Happiness with Other Variables in This Study

Variables	R	P-Value
Sex	0.012	0.865
Living arrangement	0.245	0.000
Educational level	-0.281	0.000
Financial status	0.302	0.000
Employment status	0.241	0.001
Marital status	-0.281	0.000
Location	-0.242	0.001
Number of dialysis (per week)	-0.083	0.241
Kidney transplantation	0.075	0.290
Hypercholesterolemia	-0.235	0.001
Hypertension	-0.147	0.038
Diabetes mellitus	-0.195	0.006
Kt/V	0.274	0.000
Hope	0.388	0.000

4.2. Predictors of Happiness

The multivariate analysis model indicated that marital status, educational level, Kt/V, and hope were significant predictors of happiness (Table 3). Participants living alone reported lower levels of happiness compared to those living with their families. Additionally, participants with educational achievements (under diploma, diploma, and higher degrees) were happier than illiterate participants. Those with satisfactory hemodialysis adequacy also reported higher levels of happiness compared to their counterparts. Furthermore, higher levels of hope ($\beta = 0.231$, 95% CI = 0.24 to 0.78, $P \leq 0.001$) and higher Kt/V ($\beta = 0.268$, 95% CI = 3.38 to 8.26, $P \leq 0.001$) were associated with increased happiness. Ultimately, these variables explained 47.2% of the variance in happiness among hemodialysis patients.

Table 3. Predictors for Happiness Among Patients Undergoing Hemodialysis

Variables	Mean \pm SD	Adjusted β	Adjusted P-Value (95% CI)
Marital status			
Single	30.67 \pm 7.95	-0.268	0.000 (-14.61, -5.29)
Married	36.17 \pm 10.28	-	-
Widow	25.71 \pm 8.53	-0.144	0.050 (-7.16, -0.001)
Employment status			
Unemployed	28.70 \pm 12.32	-	-
Employed	37.11 \pm 8.62	0.029	0.697 (-5.49, 8.19)
Housewife	32.38 \pm 8.65	0.069	0.351 (-1.76, 4.93)
Retired	32.88 \pm 9.80	0.104	0.332 (-2.79, 8.19)
Nongovernmental	39.81 \pm 9.34	0.182	0.093 (-0.84, 10.78)
Educational level			
Illiterate	26.79 \pm 9.43	-	-
Under diploma	35.10 \pm 8.96	0.167	0.029 (0.37, 6.93)
Diploma and higher	39.46 \pm 9.91	0.248	0.010 (1.45, 10.73)
Financial status			
Low	30.25 \pm 9.66	-	-
Middle	35.86 \pm 11.58	-0.034	0.749 (-5.44, 3.92)
High	37.55 \pm 8.82	-0.089	0.38 (-8.70, 3.35)
Living arrangement			
Alone	25.40 \pm 7.92	0.005	0.934 (-4.34, 4.73)
With family	34.02 \pm 10.52	-	-
Location			
City	34.50 \pm 10.33	-	-
Village	28.11 \pm 10.40	-0.062	0.329 (-4.85, 1.63)
Hypertension			
No	37.58 \pm 12.97	-	-
Yes	32.19 \pm 9.83	-0.080	0.188 (-5.53, 1.09)
Diabetes mellitus			
No	35.71 \pm 11.53	-	-
Yes	31.35 \pm 9.61	-0.047	0.46 (-3.73, 1.72)
Hypercholesterolemia			
No	34.97 \pm 10.51	-	-
Yes	29.48 \pm 10.01	-0.055	0.413 (-4.21, 1.73)
Kt/V			
No	30.79 \pm 10.18	0.268	0.000 (3.38, 8.26)
Yes	36.80 \pm 10.37	10.37	
Age (range: 18 – 86 years)	59.23 \pm 14.43	-0.098	0.255 (-0.97, 0.05)
Hope (range: 31 - 64)	46.43 \pm 4.81	0.231	0.000 (0.24, 0.78)

5. Discussion

This study aimed to identify the predictors of happiness among hemodialysis patients. A significant portion of the patients (69%, n = 138) reported a moderate level of happiness. Moreover, the findings indicated that educational level, marital status, hemodialysis adequacy, and hope were significant predictors of happiness in this patient group.

The majority of patients expressed low to moderate levels of happiness (81.5%, n = 163), potentially due to the challenges of undergoing dialysis several times a week, consuming large quantities of medication, facing economic burdens, and experiencing reduced social interactions. These factors align with previous research highlighting the impact of hemodialysis on patients' lives and psychological stressors that may diminish well-being and quality of life (13, 29). Bautovich et al. also noted that depression is a common issue among CDK patients and is associated with a significant risk of adverse outcomes (30).

Marital status emerged as a significant happiness predictor among hemodialysis patients. Studies by Strobel et al. and Stack and Eshleman suggest that married individuals report higher happiness levels (31, 32), whereas Sheikhmoonesi et al. (33) found no significant correlation between happiness and marital status among medical students. The positive effect of marriage on happiness could be attributed to the sense of belonging and emotional support that married individuals experience, potentially leading to a depression-free state and improved quality of life (34, 35). Moreover, married individuals may face less life pressure than their single or widowed counterparts (36). It's important to note that marriage's impact on quality of life can vary across different societies, influenced by cultural and social conditions.

Educational level played a significant role in predicting happiness, with higher education levels associated with increased happiness, whereas lower education levels, especially among illiterate individuals, corresponded with reduced happiness levels. This is consistent with findings from Saavedra and Azizi et al. (37, 38), which showed a significant association between happiness and educational level. Higher education fosters a unique mental capability that helps individuals better manage concerns related to hemodialysis, thereby enhancing their happiness.

Hope was identified as a strong predictor of happiness among hemodialysis patients, with studies by Farnia et al. (39), Billington et al. (40), and Rahimpour et al. (41) highlighting hope's role as a protective factor against anxiety and depression. Higher hope levels contribute to improved mood and mental well-being, helping hemodialysis patients cope with existential challenges and distress by fostering optimism about the future. Hopeful patients are more likely to employ problem-solving skills effectively (42, 43). Bergerot further confirmed hope as a powerful coping strategy in patients with chronic diseases,

enabling them to navigate the challenges associated with their condition effectively (44).

Based on the findings of this study, hemodialysis adequacy emerged as another predictor of happiness. Ghal-e Noie observed that patients with higher dialysis adequacy exhibited better psychological conditions compared to their counterparts (45). Al Awwa and Jallad also noted a significant inverse relationship between depression and hemodialysis adequacy (46). Optimal hemodialysis adequacy, leading to reduced accumulation of metabolites in the body and improved electrolyte balance, may contribute to more stable moods in patients.

One limitation of this study is its cross-sectional design, which constrains our ability to establish causal relationships between variables. Despite the study being conducted entirely on a voluntary basis with assurances of confidentiality, there remains a possibility that participants' responses could be biased, especially when providing sensitive information about their conditions. This is a common limitation of self-report questionnaires, where there might be a risk of receiving inaccurate responses.

5.1. Conclusions

The study found that most hemodialysis patients in Iran experience a moderate level of happiness. It also identified several factors that influence happiness among hemodialysis patients, including marital status, education level, hope, and hemodialysis adequacy, as significant predictors. These findings offer valuable insights for policy-makers and health managers to enhance the happiness of this patient group. Future research should aim to develop effective interventions to promote the mental health and happiness of hemodialysis patients.

Acknowledgements

We would like to thank the university authorities and the patients who participated in this study.

Footnotes

Authors' Contribution: SZHG and SAM conceived and designed the research method and helped to draft the manuscript. BU and FH collected the data. SAM performed the statistical analysis. SZHG and SAM revised the manuscript. All authors read and approved the final manuscript.

Conflict of Interests: The authors declare that they have no competing interests.

Data Availability: It was not declared by the authors.

Ethical Approval: This study was approved by the Ethics Committee of Qazvin University of Medical Sciences (IR.QUMS. REC. 1399.516). All methods were carried out in accordance with relevant guidelines and regulations.

Funding/Support: This study was supported by the research department of Qazvin University of Medical Science.

Informed Consent: Before data collection, written informed consent form was obtained from all the participants or their legal guardian.

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