Predictors of Happiness Among Hemodialysis Patients

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Abstract

Background

Promoting happiness in hemodialysis patients is associated with positive physical and psychological health outcomes. Therefore, the current study aimed to determine the predictors for happiness among hemodialysis patients.

Methods

This descriptive cross-sectional study was conducted among 200 patients who referred to the hemodialysis ward of Booali Sina Hospital in Qazvin, Iran, in 2020. Samples were selected through a convenience sampling method based on inclusion and exclusion criteria. The socio demographic checklist, the Oxford Happiness Questionnaire, and the Schneider's Life Expectancy Questionnaire were used for collecting the data. Multivariate regression model was used to determine the predictors of happiness.

Results

The participants' mean age was 59.23±14.43. The majority of the participants were male (n=122, 61.0%) and married (n=134, 67.0%). A majority of them (69%) reported moderate levels of happiness. The results of multivariate regression model showed that educational level ($\beta=0.248$, $p\leq0.001$), marital status ($\beta=-0.268$, $p\leq0.001$), hemodialysis adequacy ($\beta=0.268$, $p\leq0.001$), and hope ($\beta=0.231$, $p\leq0.001$) significantly predicted happiness among hemodialysis patients. Finally, the variables explained 47.2% of the variance in happiness among the patients.

Conclusions

Based on the results of the current study, managers, planners and nurses of the hemodialysis ward can play an effective role in promoting happiness and vitality in this group of patients by considering effective interventions in their daily interactions with the aim of promoting hope, emphasizing on the study and valuable outcomes of higher educational level, striving for dialysis adequacy and helping to solve common life challenges.

Background

End-stage renal disease (ESRD) is a clinical condition defined as an irreversible decline in kidney function. The average annual incidence rate of this disease in Europe is 171 per 1 million and in the United States is 336 per 1 million (1). Although the prevalence of ESRD in Iran has increased significantly in recent years, it is still lower compared with the developed countries, which may be due to poor referral and the ensuing under-diagnosis of the disease (2).

For this condition, the patient needs permanent renal replacement therapy to prevent life-threatening uremia. Among the current methods, hemodialysis is the most common one in Iran and around the world (3) so that 90% of patients, around 1 million patients in the world, who need permanent renal replacement therapy survive through hemodialysis (4).

Although hemodialysis increases patients' life expectancy, daily, and long-term exposure to various challenges of this disease has a devastating effect on their physical and mental performance, (5) and it ultimately leads to a serious decline in patients' psychological and emotional performance (6). Arterial hypertension, anemia, weakness and fatigue, and gastrointestinal symptoms such as anorexia, nausea and vomiting, and peptic ulcers are some common problems among these patients (7). Other physical and psychological symptoms include difficulty concentrating for a long time, irritability and impatience, and sleep disturbances (8).

One of the determinants of mental health which plays an essential role in shaping one's personality and mental health is happiness (9), and it is defined as a set of emotions and cognitive evaluation of life and is considered as a degree of quality of life which is positively evaluated (10). The results of Becerra's study (2015) confirmed the direct relationship of happiness with the improvement of immune system function (11). In addition, the results of Veenhoven et al.'s study (2013) showed that happiness has a positive and significant relationship with general health (12). The results of other studies have also shown that happy people are more productive, more hopeful and more adaptable. In this regard, the role of psychological factors on one's physical performance is well known so that mental health has a positive and profound effect on physical health (13). In their study, Billington and Simpson (2008) confirmed the positive effect of hope and happiness on the treatment of kidney diseases and dialysis consequences (14). One of the main and significant factors in creating happiness and vitality is the existence of hope for your future and life (15).

Hope, as a life enrichment factor, helps individuals improve their pain and suffering with a broader perspective (16). The results of Ben-Arye et al.'s study showed that hope plays a mediating role between psychological problems and quality of life, and those individuals who have higher hope experience lower distress and have higher quality of life (17). For hemodialysis patients, those patients who have more hopes for the future, feel better in different dimensions of their quality of life. The results of Snyder's study (2000) showed that promoting hope is an effective way to improve the quality of life in patients with chronic diseases (18). However, in Pour Ghaznain and Ghafari's study (2002), the results indicated that 45% of patients have a low level of hope, 43.5% of them have a moderate level, and only 11.5% of them have a high level (19).

Hemodialysis patients experience a variety of physical and psychological challenges on a daily basis. Dialysis adequacy is an important and effective factor in reducing or modifying these problems (20). Hemodialysis adequacy is one of the significant criteria to evaluate patients undergoing hemodialysis, and achieving high adequacy is one of the significant goals in dialysis wards (21). The more the dialysis

adequacy, the less uremic complications will be observed in different organs (22), and patients will have a better condition and more life expectancy (21).

One of the main causes of mortality in hemodialysis patients is dialysis inadequacy (23). Its common consequences including poor nutrition, nausea and vomiting, anorexia, headache, depression and insomnia and high levels of stress severely affect the patient's quality of life (20). In such circumstances, serious psychological consequences of the disease and treatment can be prevented by improving the hemodialysis adequacy along with improving the complications of uremia and its effects on other organs (24). Clinical evidence as well as the results of several studies have shown that high-quality hemodialysis can have a positive effect on improving the physical and psychological consequences of this disease (5, 25).

Due to the high prevalence of psychological problems among hemodialysis patients and its serious physical and psychological consequences (16), it is necessary to pay special attention to effective physical and psychological concepts such as happiness with a positive psychological approach. Therefore, the aim of this study is to determine the levels of happiness and its predictors among hemodialysis patients in Qazvin.

Methods

Study Design

This study used a descriptive, cross sectional design to determine predictors of happiness among hemodialysis patients.

Setting and Participants.

In the current study, 200 patients, who referred to the main hemodialysis center in Qazvin province, were selected through a convenience sampling method based on inclusion and exclusion criteria. Participants met the inclusion criteria if they were aged over 18 years, under hemodialysis treatment for at least 6 months and willing to participate. Exclusion criteria were history of severe stress during the past month, having psychological problems according to the patient's statements or medical record, history of using psychotropic drugs and having severe physical problems which prevents the researcher from interacting with the patient.

Sample Size

Considering a type I error of 0.05 (confidence level of 0.95) and a type II error of 0.2 (power test of 0.80), the sample size was estimated as follows.

$$n = \frac{(Z_{1-\frac{\alpha}{2}} + Z_{1-\beta})^2}{w^2} + 3 = \frac{(1.96 + 1.28)^2}{(-./24)^2} + 3 = 185$$

The final sample size of 200 was calculated due to the possible non-response rate of 10%.

Instruments

Demographic characteristics

The socio demographic checklist included the following variables: age, sex, educational level, marital status, employment status, financial status, number of dialysis per week, and history of any underlying diseases.

Kt/V

The dialysis adequacy was assesses using the parameter Kt/V. In this formula, K is the dialyzer clearance, t is dialysis session time, and V is the distribution volume of urea.

The Oxford Happiness Questionnaire

This questionnaire was first developed by Argyle and Crossland in 2002, and it measures one's happiness through 29 items. Responding to each item is based on a 4-point Likert scale from a (0) to d (3). The overall score ranges between 0 and 87. A score between 40 and 42 is considered appropriate (26). This questionnaire was translated into Persian by Sharifi et al. in 1997, and its validity and reliability in Iran have been reported to be desirable using internal consistency and Cronbach's alpha of 0.91 by Alipoor and Noorbala in 1999 (27).

The Schneider's Life Expectancy Questionnaire

This scale was developed by Schnieder et al. in 1991 to measure hope in individuals aged over 15 years. The scale consists of 12 items in which responding to each item is based on a 5-point Likert scale strongly disagree to strongly agree. In this scale, hope is measured through 2 subscales of agency thinking and pathway thinking. 4 items measures agency thinking (2, 9, 10, and 12) and 4 measures pathways thinking (1, 4, 7, and 8). Items 3, 5, 7, and 11 are distractors intended to make the content of the scale less obvious. The overall score ranges between 8 and 64, and higher score indicates more life expectancy. The validity and reliability of the scale in Iran have been reported to be desirable using internal consistency and Cronbach's alpha of 0.89 by Golzari et al. in 2007 (28).

Data collection

Data collection was done from April to May 2021. Ethical approval was obtained from the ethics committee of Qazvin University of medical science in Iran (IR.QUMS.REC.1399.516). Before data collection, written informed consent form was obtained from all the participants. The response rate was 100%, and 200 questionnaires were analyzed.

Data analysis

The collected data were analyzed using the Statistical Package for the Social Sciences, version 20.0 (SPSS Inc., Chicago, Illinois, USA). Quantitative variables were described using means and standard deviations (SD), and qualitative variables were described by frequencies and percentages. To determine the predictors of happiness, Pearson correlation coefficient was first run, and then, the variables which were significantly associated with happiness were included in the multivariate regression model. Statistical significance was considered at $p<0.05$.

Results

In the current study, the participants' mean (SD) age was 59.23 (14.43) years ranging from 18 to 86. The participants were predominately male (n = 122, 61.0%) and married (n = 134, 67.0%). More than one third of them were illiterate (n = 72, 36.5%) and more than half of them reported to have low financial status (n = 105, 52.5%). The majority of them suffered from hypertension (n = 164, 82.0%) and did not have a satisfactory hemodialysis adequacy (n = 121, 60.5%). Table 1 describes the participants' demographic characteristics in details.

Table 1
Participants' demographic characteristic

Variables		No.	%
Sex	female	78	39
	male	122	61
Living arrangement	alone	20	10
	with family	180	90
Educational level	Illiterate*	72	36.5
	under diploma	77	38.5
	diploma and higher	50	25
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
	widow	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

Table 2
Distribution happiness among patients under hemodialysis

happiness	No.	%
Low	25	12.5
Average	138	69
High	36	18
Very high	1	0.5

As depicted in Table 2, the majority of the participants had average levels of happiness (n = 138, 69%), and only 18.5% of them (n = 37) had high and very high levels. The mean (SD) scores of happiness and hope were 33.16 (10.64) and 46.43 (4.81), respectively.

Correlated Factors Of Happiness

To investigate the relationship between the variables, Pearson correlation coefficient was performed. The results of this test are reported in Table 3. The variables that showed a significant association with the happiness were included in the multivariate regression model.

Table 3
Associations of happiness with other variables in this study

variables	r	p
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

Predictors Of Happiness

Multivariate analysis model showed that marital status, educational level, Kt/V and hope were statistically significant predictors for happiness (Table 4). Alone participants compared with those lived with their family reported lower levels of happiness. Furthermore, those with under diploma, diploma and higher degrees compared with illiterate participants were happier. The participants with satisfactory hemodialysis adequacy compared with their counterparts also reported higher levels of happiness. Additionally, having higher levels of hope ($\beta = 0.231$, 95% CI = 0.24 to 0.78, $p \leq 0.001$) and higher KTV ($\beta = 0.268$, 95% CI = 3.38 to 8.26, $p \leq 0.001$) were related to higher levels of happiness. Finally, the variables explained 47.2% of the variance in happiness among patients undergoing hemodialysis.

Table 4
Predictors for happiness among patients undergoing hemodialysis

variables		M (SD)	Adjusted β	Adjusted p-value (95% CI)
Marital status	single	30.67 (7.95)	-0.268	0.000 -14.61- -5.29
	married	36.17 (10.28)	-	-
	widow	25.71 (8.53)	-0.144	0.050 -7.16- -0.001
Employment status	unemployed	28.70 (12.32)	-	-
	employed	37.11 (8.62)	0.029	0.697 -5.49-8.19
	housewife	32.38 (8.65)	0.069	0.351 -1.76-4.93
	retired	32.88 (9.80)	0.104	0.332 -2.79-8.19
	nongovernmental	39.81 (9.34)	0.182	0.093 -0.84-10.78
Educational level	illiterate	26.79 (9.43)	-	-
	under diploma	35.10 (8.96)	0.167	0.029 0.37–6.93
	diploma and higher	39.46 (9.91)	0.248	0.010 1.45–10.73
Financial status	low	30.25 (9.66)	-	-
	middle	35.86 (11.58)	-0.034	0.749 -5.44-3.92
	high	37.55 (8.82)	-0.089	0.38 -8.70-3.35
Living arrangement	alone	25.40 (7.92)	0.005	0.934 -4.34-4.73

variables		M (SD)	Adjusted β	Adjusted p-value (95% CI)
	with family	34.02 (10.52)	-	-
Location	city	34.50 (10.33)	-	-
	village	28.11 (10.40)	-0.062	0.329 -4.85 -1.63
Hypertension	no	37.58 (12.97)	-	-
	yes	32.19 (9.83)	-0.080	0.188 -5.53-1.09
Diabetes mellitus	no	35.71 (11.53)	-	-
	yes	31.35 (9.61)	-0.047	0.46 -3.73-1.72
Hypercholesterolemia	no	34.97 (10.51)	-	-
	yes	29.48 (10.01)	-0.055	0.413 -4.21-1.73
Kt/V	no	30.79 (10.18)	0.268	0.000 3.38–8.26
	yes	36.80	10.37	
variables	**M (SD)**	**Range**	**Adjusted β**	**Adjusted p-value (95% CI)**
Age	59.23 (14.43)	18–86	-0.098	0.255 -0.97- 0.05
Hope	46.43 (4.81)	31–64	0.231	0.000 0.24–0.78

Discussion

This study aimed to determine the levels of happiness and its predictors among patients undergoing hemodialysis in Qazvin. The findings revealed that happiness was low in 12.5% of patients, moderate in 69%, high in 18% and very high in 0.5%. Furthermore, the results of multivariate regression analysis model showed that educational level, marital status, hemodialysis adequacy and hope significantly predict

happiness in participants. Hemodialysis patients who had adequate hemodialysis, had better life expectancy, were married and had higher education level reported higher levels of happiness. Finally, the variables predicted 47.2% of the variance in happiness among patients undergoing hemodialysis.

Regarding the levels of happiness among hemodialysis patients, the findings showed that the majority (69%) had average levels of happiness and 18% had high and very high levels. In line with this finding, the results of Farnia et al.'s study (2016) showed that the mean score of happiness among hemodialysis patients was 56.8 before the intervention. In general, individuals' happiness and vitality are affected by several variables. The participants were predominately male (61.0%) and married (67.0%), and more than half of them (52.5%) reported to have low financial status. Living in such conditions puts extra pressure on the person, and this level of happiness among these patients is not unexpected. Taking everything into consideration, the remarkable finding of the current study is that the levels of happiness among hemodialysis patients were higher than Iranian people based on the results of Alipour's study (2007), which definitely needs to be studied in greater details (29).

The results of multivariate regression model revealed that being married is one of the predictors for happiness among hemodialysis patients. In line with this finding, the results of a study by Strobel et al. (2016) showed that there is a significant relationship between happiness and marital status, and married people have higher levels of happiness (30). Abbasi et al.(2018) also found a direct and significant relationship between happiness and marital status (31). Furthermore, Stack and Eshleman (1998) showed that marriage can increase happiness (32). However, Sheikhmoonesi et al. (2013) could not find a significant relationship between happiness and marriage among medical students (33). This contradiction may be due to the differences in the conditions and characteristics of the samples.

Regarding the predictors for happiness, the findings showed that patients with higher educational level experienced more happiness. In line with this finding, the results of Javier's study (2016) showed a significant association of happiness with sex, marital status and educational level (34). In Azizi et al.'s study (2017), a significant association of happiness with educational level was also observed (31). Higher educational level and having greater knowledge definitely create a unique mental ability in individuals, which result in more effective management of challenges of life with hemodialysis. Accordingly, patients with higher educational level have more ability to manage hemodialysis challenges and have higher levels of happiness.

The findings showed that hope is one of the strong predictors for happiness among hemodialysis patients. Farnia et al. (2015), also observed that hope therapy increase happiness among hemodialysis patients in all domains except positive mode (36). In a similar study conducted by Billingtonet al. (2008), hope was identified as an independent predictor for anxiety and depression among hemodialysis patients (14). The results of Rahimipour et al.'s study (2015) also showed that promoting hope in hemodialysis patients leads to a reduction in anxiety, stress and depression (37). Higher levels of hope boost mood and are associated with physical health, and lower levels of anxiety as well as depression. Hemodialysis patients coped with existential challenges and distress by creating hope. Additionally, hopeful patients in

comparison with those who are not use more problem-solving skills (6, 38). Bergerot (2019) believed that hope is a powerful coping mechanism in patients with chronic diseases, and those who are hopeful can more easily tolerate the challenges caused by the disease (39).

Regarding the predictive role of hemodialysis adequacy, the findings showed that hemodialysis adequacy is one of the predictors for happiness. There is no strong and acceptable evidence regarding the relationship between hemodialysis adequacy and psychological problems. However, we can point to the result of Ghal-e Noie (2020) that anxiety, depression and psychological problems are lower in patients who have higher dialysis adequacy compared with those who have lower dialysis adequacy (40). In this regard, the results of the Al Awwa's study (2018) showed that there is a significant inverse relationship between depression and hemodialysis adequacy (41). This result can be physiologically justified. As the more adequate the dialysis, the less accumulation of metabolites in the body, and the patient with a better electrolyte balance will experience a more balanced mood.

Limitations

One limitation of the current study was its cross-sectional nature which limits our ability to determine the causal relationships among the concepts. Although the study was carried out on a completely voluntary basis and the patients were given assurances of confidentiality of information, they may not have answered in a completely non-biased manner due to the sensitivity of information related to their condition. This is a common limitation of self-report questionnaires in patient populations.

Conclusions

The results of the current study showed that significant changes in hemodialysis patients' happiness and vitality are affected by hope, educational level, marital status, and hemodialysis adequacy. Accordingly, managers, planners and nurses can play an effective role in promoting happiness and vitality in this group of patients by considering effective interventions in their daily interactions with the aim of promoting hope, emphasizing on the study and valuable outcomes of higher educational level, striving for dialysis adequacy and helping to solve common life challenges.

Abbreviations

ESRD
End-stage renal disease.

Declarations

Ethical approval and consent to participants

The study was approved by the Ethics Committee of Qazvin University of Medical Sciences, Qazvin, Iran (IR.QUMS.REC. .1399.516). All methods were carried out in accordance with relevant guidelines and

regulations. Before data collection, written informed consent form was obtained from all the participants and their legal guardian.

Consent for publication

Not applicable

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

Competing interests

The authors declare that they have no competing interests.

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Authors' Contributions

SZHG, 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.

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