



The Effect of Fordyce Happiness Training on Life Expectancy and Quality of Life in Hemodialysis Patients: An Intervention Study in Yazd, Iran

Bahareh Fallah¹, Najmeh Baghian², Akram Mehrabbeik³, Mehdi Karimi Zarchi⁴, Hossin Nazmiah⁵, Majid Hajimagsoudi⁶, Mohammad Hossein Dehghani^{7,*}

¹ Faculty of Nursing and Midwifery, Research Center for Nursing and Midwifery Care, Trauma Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

² Clinical Research Development Center, Shahid Rahneemoun Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

³ Diabetes Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

⁴ Trauma Research Center, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

⁵ Faculty of Nursing and Midwifery, Research Center for Nursing and Midwifery Care, Trauma Research Center, Shahid Sadoughi University of Medical Sciences and Health Service, Yazd, Iran

⁶ Department of Emergency Medicine, School of Medicine, Shahid Rahneemoun General Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

⁷ Department of Anesthesiology and Critical Care, School of Medicine, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

* **Corresponding Author:** Clinical Research Development Center, Shahid Rahneemoun Hospital, Shahid Sadoughi University of Medical Sciences, Yazd, Iran Email: mh.dehghanii99@gmail.com

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Abstract

Background: Dialysis patients frequently experience issues such as fear, reduced social activity, and hopelessness due to lifestyle changes and treatment requirements.

Objectives: This study aimed to determine the effect of Fordyce happiness training on quality of life and life expectancy in hemodialysis patients.

Methods: This quasi-experimental intervention study involved 48 hemodialysis patients who were referred to Shahid Rahneemoun Hospital in Yazd, Iran, and selected through simple random sampling. Data collection tools included the Quality-of-Life Questionnaire for Kidney Patients (KDQOL-36) and the Miller Life Examination Questionnaire. Patients participated in ten 60-minute training sessions, held twice weekly. Data were collected at baseline and one month after the intervention and analyzed using SPSS 21 software.

Results: Following Fordyce's happiness training, levels of potassium (K), creatinine (Cr), and blood urea nitrogen (BUN) in patients significantly decreased. Before the intervention, the mean scores for quality of life and life expectancy in dialysis patients were 51.9 ± 28.27 and 169.75 ± 11.95 , respectively, which increased to 64.66 ± 27.17 and 179.95 ± 9.37 after the intervention. Paired *t*-test results indicated that Fordyce happiness training had a statistically significant positive effect on patients' quality of life ($P < 0.05$) and life expectancy ($P < 0.05$).

Conclusions: The Fordyce happiness training program can improve quality of life and life expectancy in dialysis patients. In other words, happiness training may serve as a preventive strategy against mental disorders such as depression, anxiety, and life dissatisfaction in dialysis patients.

Keywords: Dialysis, Happiness, Life Expectancy, Quality of Life

1. Background

Chronic kidney disease (CKD) is a significant public health issue, with a global prevalence of approximately 13% (1, 2). One of the severe outcomes of CKD is end-stage

renal disease (ESRD), a condition in which the kidneys lose their function entirely, and without treatment, this can lead to death (3, 4). Although nearly 90% of ESRD patients reside in high-income countries, it is estimated that by 2030, over 70% of these patients will be from

developing countries such as Iran (5). Hemodialysis is the most common treatment for ESRD patients; in the United States, for instance, 71% of ESRD patients rely on various forms of dialysis. Hemodialysis remains the most widely used type of dialysis worldwide (6).

While hemodialysis serves as a life-sustaining and standard treatment for patients with CKD, their quality of life often remains below optimal levels (7). Hemodialysis can cause fatigue, weakness, muscle cramps, social isolation, and ultimately disrupt employment, family life, and social status (8, 9). This combination of complications frequently leads to psychological disorders such as depression, anxiety, stress, and frustration, which further decrease patients' quality of life and life expectancy (10, 11).

Happiness and vitality are significant factors that influence the quality of life and life expectancy in hemodialysis patients (12). Happiness, considered essential for health and well-being, is also used as a non-pharmacological intervention to manage disease-related consequences (13). Mental health interventions, including those focused on happiness, are primarily rooted in educational concepts; thus, education is one of the recommended strategies to improve the quality of life in patients with chronic conditions (14, 15).

In this context, Fordyce introduced an educational program aimed at promoting happiness (16). Research has demonstrated that this program, which integrates cognitive, behavioral, and social components, can effectively enhance mental health (17, 18). For example, Lyubomirsky and Layous suggest that happiness training can reduce depression and increase psychological well-being (19). The findings of Mirbolouk's study also indicate that Fordyce happiness training improves life expectancy in patients undergoing heart surgery (20), and further evidence suggests its effectiveness in promoting psychological well-being and alleviating psychological pressures in women with physical-motor disabilities (21).

The quality of life and sense of hope are critical factors for chronic patients. Feelings of despair, often accompanied by diminished resilience, are common in dialysis patients (22). Hope serves as a crucial coping mechanism for individuals facing chronic illnesses. Benzein states that hope, both physiologically and emotionally, empowers patients to withstand the crises associated with illness (23). When dialysis patients maintain hope for the future, they experience improved well-being across various life domains, fostering a positive feedback loop that can enhance their quality of life and sense of hope. Strengthening hope is thus a

valuable strategy for increasing self-care, improving quality of life, and promoting overall health (24).

2. Objectives

It is essential to take a comprehensive approach to health in hemodialysis patients by emphasizing the role of happiness in enhancing quality of life and increasing life expectancy. Given the scarcity of similar studies in Iran, this study was conducted to assess the impact of Fordyce happiness training on quality of life and life expectancy in hemodialysis patients.

3. Methods

This study was a quasi-experimental intervention without a control group. Based on a previous study (25), the standard deviations of the quality-of-life scores in the intervention and control groups were 2.1 and 2, respectively. With a 95% confidence level, 80% power, a mean difference of 1.3, and allowing for a 5% dropout rate, a sample size of 41 participants was determined.

$$n = \frac{\left(2 \times Z_{1-\frac{\alpha}{2}} + Z_{1-\beta}\right)^2 \times (SD^2)}{(\mu_0 - \mu_1)^2} \quad (1)$$

Among hemodialysis patients referred to Shahid Rahnemoun Hospital in Yazd from September to December 2020, 48 participants were selected using simple random sampling. Inclusion criteria included undergoing dialysis sessions 2 or 3 times per week, age between 30 and 60 years, at least 6 months since the first dialysis session, no history of mental illness or visual and auditory impairments, ability to communicate verbally, and proficiency in the Persian language. Patients with a history of participating in similar training programs or experiencing severe mental stress within the past six months—such as divorce, bankruptcy, or the death of a loved one—were excluded. Patients missing more than three sessions of the training program were considered as having withdrawn from the study.

Data collection tools included two standard questionnaires: the Kidney Disease Quality of Life Short Form (KDQOL-SF36) and the Miller Life Expectancy Questionnaire, as well as a demographic information form. Quality of life and life expectancy were considered primary outcomes, while the levels of Na, K, BUN, and Cr were measured as secondary outcomes at the beginning and one month after the intervention. The KDQOL-SF36 was specifically developed for dialysis patients and consists of general and disease-specific sections. The general section contains 36 questions across eight

dimensions: Physical function (10 questions), role limitations due to physical problems (4 questions), role limitations due to emotional problems (3 questions), social functioning (2 questions), emotional well-being (5 questions), pain (2 questions), energy/fatigue (4 questions), perception of general health (5 questions), and an overall health question.

The specific section of the KDQOL-SF36 questionnaire includes 45 questions covering 11 subscales: Symptoms/problems (12 questions), impact of kidney disease on life (8 questions), burden of kidney disease (4 questions), work status (2 questions), cognitive function (3 questions), quality of social interaction (3 questions), sexual function (2 questions), sleep (4 questions), social support (2 questions), encouragement from dialysis staff (2 questions), and patient satisfaction (1 question). Scores range from 0 to 100, with higher scores indicating better quality of life. The validity and reliability of this questionnaire for the Iranian population have been confirmed by Rahimi et al. (26). The Miller Life Expectancy Questionnaire assesses 48 aspects of hopelessness and helplessness, with responses rated on a Likert Scale (from very negative to very positive). Scores on this questionnaire range from 48 to 240, indicating an individual's level of hope (20). Hosseinian also verified the validity and reliability of this questionnaire in Iran (27).

At the beginning of the study, patients completed the quality of life and life expectancy questionnaires. The Fordyce Happiness Training intervention was then administered over ten 60-minute sessions conducted by a clinical psychologist experienced in Fordyce Happiness Training. Each session included group discussions, brainstorming, and educational videos. The content of the previous session was reviewed at the beginning of each session, and patients were given practical exercises aligned with the techniques taught. They also received booklets, educational pamphlets, and CDs for further learning. The protocol of the Fordyce Happiness Training Program is summarized in Table 1.

Patients completed the questionnaires again one month after the intervention, and data were analyzed for 41 participants (7 patients did not complete the full series of educational sessions). Descriptive and inferential statistics, including a normality test and paired t-test, were used for data analysis in SPSS 21.

4. Results

The mean age of the participants was 51.75 ± 10.48 years, with 31.7% over 50 years old. The majority were male (70.7%), most were married (92.7%), and 29.3% had

only primary education. Participants underwent an average of 2.96 ± 0.47 dialysis sessions per week. Among the participants, the prevalence of comorbidities was as follows: Diabetes in 29.3%, heart disease in 4.9%, and kidney disease in 39%.

The findings revealed that levels of potassium (K), creatinine (Cr), and blood urea nitrogen (BUN) significantly decreased after Fordyce's happiness training, with statistical significance. However, sodium (Na) levels increased post-intervention, though this change was not statistically significant (Table 2).

The mean quality of life score for patients before the intervention was 51.9 ± 28.27 , which significantly improved to 64.66 ± 27.17 following the intervention ($P < 0.05$). As shown in Table 3, there was a statistically significant improvement across all aspects of quality of life.

According to Table 4, the mean life expectancy scores of patients before and after the intervention were 169.75 ± 11.95 and 179.95 ± 9.37 , respectively, indicating a significant increase between the two groups ($P < 0.05$).

5. Discussion

The present study investigated the effect of Fordyce happiness training on laboratory markers, quality of life, and life expectancy in dialysis patients. The results indicated that the quality of life for dialysis patients was generally low. A similar study conducted by Rouhi et al. found that dialysis patients had poor quality of life (28), consistent with our findings. Additionally, a study by Ramatillah et al. in Malaysia also reported unsatisfactory quality of life among dialysis patients (29), which may be attributed to the chronic and debilitating nature of kidney disease.

Our findings showed that the Fordyce Happiness Training Program positively impacted patients' quality of life and life expectancy. This aligns with results from Samadzadeh et al.'s study, which found that Fordyce training effectively improved physical function, physical role, general health, vitality, social function, emotional role, and mental health in dialysis patients (30). Similarly, a study by Mehrabi et al. demonstrated that Fordyce happiness training helped reduce stress, anxiety, and depression in dialysis patients (11). D'Souza et al. also reported that educational interventions positively affected the quality of life and physical and mental health of diabetic patients undergoing hemodialysis (31). Previous studies have indicated a strong correlation between happiness, quality of life, and life satisfaction, suggesting that happiness training can effectively reduce depression and enhance quality

Table 1. Protocol of the Fordyce Happiness Training Program

Session	Topics
First	Familiarization of participants with each other, review of the structure of sessions, relevant rules and regulations and how to work, training the technique of increasing activity and being more active
Second	Training the techniques of increasing social relationships and intimacy
Third	Training the techniques of increasing creativity, knowledge and research in applied psychology
Fourth	Training the techniques of better planning and organizing
Fifth	Training the techniques of stopping worries
Sixth	Training the techniques of lowering expectations and being yourself
Seventh	Training the techniques of developing positive thinking and optimism
Eighth	Training the techniques of living in present time
Ninth	Training the techniques of expression of the emotions
Tenth	Training the techniques of valuing happiness

Table 2. Evaluation of Laboratory Markers in Patients Before and After Intervention ^a

Variables	Mean ± SD	P-Value
K		0.00
Before	5.16 ± 0.78	
After	4.83 ± 0.81	
Na		0.074
Before	132.48 ± 6.86	
After	134.58 ± 3.02	
Cr		0.00
Before	9.50 ± 2.66	
After	9.33 ± 2.85	
BUN		0.00
Before	81.28 ± 54.50	
After	80.11 ± 53.41	

Abbreviations: K, potassium; Na, sodium; Cr, creatinine; BUN, blood urea nitrogen.

^a Values are expressed as mean ± SD.

of life for hemodialysis patients (32, 33). Therefore, our results are consistent with previous research.

Although few studies have specifically examined the effect of Fordyce Happiness Training on quality of life in dialysis patients and none have explored its impact on their life expectancy, several studies have assessed its benefits in other populations. A study by Raeisi found that Fordyce-style happiness training positively influenced mental health and happiness among students (16). Similarly, Nazari et al.'s study reported that the Fordyce Happiness Training Program increased happiness and reduced stress in pregnant women (34). In another study, Sargolzaei et al. showed that Fordyce training significantly improved mental health outcomes in thalassemia patients compared to a control group ($P < 0.001$).

A study by Hariri and Khodami found that the Fordyce Happiness Training Program significantly improved life expectancy in the elderly (35). Similarly, Mirblok et al. demonstrated that Fordyce happiness training increased life expectancy in patients undergoing heart surgery (20). Consistent with our findings, Lyubomirsky and Layous's study showed that happiness training reshapes individuals' cognitive and emotional perspectives, fostering a more positive outlook on life (19). Evidence suggests that achieving happiness is a primary goal for people and is often regarded as superior to other values; other human aspirations are seen as valuable when they contribute to an increase in happiness (33).

For this reason, quality of life and life expectancy tend to be higher in happier individuals. Thus, it is crucial for policymakers and health planners to focus on

Table 3. Mean Score of Quality of Life in Patients Before and After Fordyce Happiness Training ^a

Variables	Before	After	P-Value
Symptoms/Problems	64.38 ± 23.93	73.52 ± 22	0.002
Effects of kidney disease	44.97 ± 24.33	56.93 ± 26	0.005
Burden of disease	38.56 ± 29.64	48.19 ± 26.97	0.036
Occupational status	33 ± 30.76	40.24 ± 33.94	0.035
Cognitive function	51.87 ± 26.26	63.08 ± 24.9	0.038
Quality of social interaction	59.67 ± 24.4	68.95 ± 21.25	0.042
Sexual function	45.73 ± 40.37	69.51 ± 42.3	0.007
Sleep	36.75 ± 23.76	48.95 ± 20.31	0.046
Social support	80.08 ± 21.48	89.95 ± 25.77	0.012
staff encouragement	79.27 ± 22.46	91.75 ± 21.38	0.020
Patient satisfaction	63.81 ± 38.71	77.58 ± 20.44	0.012
General degree of health	68.05 ± 15.68	79.48 ± 22.24	0.041
Physical activity	59.88 ± 35.94	69 ± 27.23	0.04
Physical limitations	19.51 ± 34.69	29.88 ± 35.45	0.049
bodily pain	33.53 ± 31.43	48.17 ± 34.3	0.014
General health	52.68 ± 17.21	64.66 ± 15.49	0.039
Vitality	52.44 ± 25.64	71.12 ± 29.05	0.014
Social Performance	51.83 ± 27.89	63.44 ± 27.84	0.032
Emotional constraints	43.9 ± 46.8	65.53 ± 45.8	0.016
Mental health	58.05 ± 23.97	73.22 ± 20.7	0.029
Dedicated dimension of all diseases	55.5 ± 26.8	67.34 ± 25.6	0.012
Mental health dimension	51.5 ± 31.1	68.3 ± 30.1	0.01
Physical health dimension	41.4 ± 29.8	52.9 ± 28.1	0.013
Total score of quality of life	51.90 ± 28.27	64.66 ± 27.17	0.014

^a Values are expressed as mean ± SD.

Table 4. Mean Score of Life Expectancy in Patients Before and After Fordyce Happiness Training ^a

Variable	Before	After	Difference	t-test
Life expectancy	169.75 ± 11.95	179.95 ± 9.37	10.19 ± 13.32	t = 4.89; df = 40; P = 0.000

^a Values are expressed as mean ± SD.

promoting happiness in chronic patients, including those undergoing dialysis, who often face numerous side effects during treatment. We recommend that medical institutions incorporate programs aimed at enhancing happiness and improving quality of life alongside clinical interventions for dialysis patients. Additionally, we encourage stakeholder organizations to place greater emphasis on the well-being and happiness of chronic patients. Enhancing well-being and happiness not only improves the quality of life and life expectancy of these patients but also positively impacts the quality of life and satisfaction of their families, caregivers, healthcare providers, and, ultimately, the broader community (36).

Our study also found that some laboratory markers, such as K, Cr, and BUN, were improved in patients after the intervention. Since there was no change in medication during the one-month follow-up, it is likely that happiness training enhanced patients' motivation to adhere to dietary and medication regimens, which ultimately improved these laboratory markers and helped manage their condition. In a study by Pereira, a significant correlation was found between the physical capacity dimension of quality of life and hemoglobin levels in dialysis patients (37). However, Siqueira et al. did not find a correlation between clinical and laboratory markers in dialysis patients and their levels of happiness (38).

The effect of Fordyce Happiness Training on clinical variables may be due to the observed improvements in quality of life and life expectancy among participants. Given the short follow-up period (one month) and the lack of changes in patient treatment during this time, along with the absence of any other interventions apart from happiness training, the observed changes can likely be attributed to this intervention. In other words, patients with an enhanced quality of life and life expectancy tend to engage in more consistent self-care, adhere better to treatment regimens, maintain healthier diets, and adopt more intentional physical activities and behaviors, all of which positively influence their physical health and clinical outcomes. Evidence also supports that happier individuals are more likely to participate in meaningful activities and exhibit higher levels of positivity (16). Additionally, such individuals often experience better health and possess a stronger immune system due to increased hopefulness and well-being (21).

This study had several limitations. The small sample size and the absence of a control group limited the ability to make comparisons. Additionally, factors such as genetic predispositions, lifestyle choices, access to healthcare, socioeconomic status, and environmental influences—which can significantly impact life expectancy—were not accounted for, presenting another limitation in fully understanding the results.

5.1. Conclusions

This study demonstrated that the Fordyce Happiness Training Program can effectively enhance the quality of life and life expectancy of dialysis patients. Given the chronic nature of kidney disease, incorporating happiness training as a preventative strategy may help mitigate mental health challenges such as depression, anxiety, and life dissatisfaction commonly experienced by dialysis patients. Therefore, it is recommended that healthcare providers consider implementing this training program within dialysis departments to support patients' mental well-being alongside their physical care.

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Footnotes

Authors' Contribution: B. F., and M. H. D.: Designed and managed the project; N. B., and A. M.: Collected the data; M. K. Z., M. H. M., and H. N.: Analyzed and interpreted the results; B. F.: Writing the manuscript; M. H. D. and M. H. M.: Revised the manuscript. All authors read and approved the final manuscript.

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Data Availability: The dataset presented in the study is available on request from the corresponding author during submission or after publication.

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