

Examining Differences in Body Image and Self-Empowerment between Individuals with and without Kidney Stones

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Received 2024-09-25; Accepted 2024-12-30; Online Published 2025-09-01

Abstract

Introduction: The purpose of this research was to examine the differences in body image and self-empowerment between individuals with and without kidney stones.

Methods: This descriptive study was conducted on individuals with and without kidney stones in Isfahan. The sample was purposively selected, consisting of 384 participants with kidney stones and 384 participants without. Data collection tools included the Fisher Body Image Scale (FBIS) and the Short Form of the Empowerment Scale (ES-SF). Data were analyzed using SPSS-24 and AMOS-24 through variance analysis and multivariate analysis of variance.

Results: The results showed that there are differences in body image and self-empowerment between individuals with and without kidney stones. The magnitude of these differences was 0.41 and 0.32, respectively.

Conclusion: Based on the results, it can be concluded that there are differences in body image and self-empowerment scores between individuals with and without kidney stones. The satisfaction with body image and self-empowerment actions were higher and more favorable in individuals without kidney stones compared to those with kidney stones.

Keywords: Body image, self-empowerment, kidney stones.

Citation: Tavakoli F, Pournaghash Tehrani S, Afrooz GA, Ghanaat I, Kazemi Zahrani H. Examining Differences in Body Image and Self-Empowerment between Individuals with and without Kidney Stones. *Int J Travel Med Glob Health*, 2025;13(3):212-219. doi:10.30491/ijtmgh.2024.480380.1434.

Introduction

The prevalence and incidence of kidney stones are increasing worldwide¹. Kidney stones are hard deposits of minerals (calcium, oxalate, and phosphate) formed from dissolved minerals in urine, and they are typically passed through the urinary tract. Kidney stones are the third most common urinary system problem, following urinary tract infections and prostate disorders². Epidemiologically, approximately 5% of women and 12% of men experience kidney stones during their lifetime³. Risk factors associated with kidney stones vary among different population groups, with environmental factors playing a key role in their pathogenesis⁴. Research has shown that the occurrence of kidney stones can be related

to gender, race, geographic location, family history, unhealthy diet, smoking, alcohol consumption, obesity, low fluid intake, occupation, socio-economic status, education, genetic background, and metabolic disorders⁵. On the other hand, there is limited research on the psychological factors contributing to the incidence, prevalence, and recurrence of kidney stones. There is a reciprocal relationship between this condition and psychological issues. Therefore, the current study aims to update the mechanisms of care behaviors and self-empowerment to enhance the understanding of cognitive factors influencing kidney stone exacerbation for urologists, nephrologists, and primary care providers.

One psychological and psychosomatic factor addressed in this study is body image, which is crucial in self-regulation and decision-making. Body image is a multidimensional concept that encompasses individuals' perceptions, thoughts, behaviors, and attitudes—both positive and negative—about their bodies and appearance⁶. This term was coined by Paul Schilder (1935), who defined body image as the mental representation of one's own body that individuals develop. The development of body image is dynamic, influenced not only by physical characteristics (e.g., body size or shape) or psychological factors (e.g., perfectionism, low self-esteem) but also by socio-cultural contexts⁷. Therefore, body image not only affects how individuals perceive their bodies but also influences how they interact with the world through their bodies. Body image is also a significant factor in the recurrence and poor prognosis of disorders related to diet⁸, and the impact of body image on eating behaviors in individuals with kidney stones is a serious risk factor for the individual's quality of life⁹.

According to the World Health Organization (2018), empowerment is a process where individuals have significant control over decisions related to their health. For those with health conditions, shared decision-making is crucial, which occurs when individuals take responsibility for their own health. People can learn problem-solving with the help and support of health professionals. Empowerment begins when health professionals believe individuals can manage their own care, and its goal is to enhance an individual's capacity for critical thinking and decision-making regarding their health.

Kidney stones are a costly disorder due to the significant financial burden they impose on patients and society. Epidemiological assessment of the issue, particularly evaluating related risk factors, may lead to finding suitable approaches to reduce the risk of kidney stone formation. Some studies have yielded conflicting results regarding the risk factors associated with kidney stones, and further research is needed to resolve these ambiguities. Additionally, limited studies in Iran have reported on the psychological factors affecting kidney stones and their prevalence among potential samples in a population-based study. This research aims to investigate the psychological, psychosomatic, and medical factors associated with kidney stones that may hinder empowerment actions, self-care, and making appropriate health decisions to prevent or manage kidney stones.

The comparative nature of this study is essential. It is scientifically important to determine whether the level of satisfaction with body image and self-empowerment differs between individuals with kidney stones and those

without. Such findings could enhance the research's value for both the scientific community and practical application. Consequently, the main focus of this study is to compare body image and self-empowerment between individuals with and without kidney stones. The study emphasizes comparing satisfaction with body image and self-empowerment between these two groups, aiming to underline the importance of these differences in both patient and non-patient populations. Given this context, the research question is whether there is a difference in body image and self-empowerment between individuals with kidney stones and those without.

Methods

This descriptive study was conducted on all individuals with and without kidney stones in Isfahan in 2024. Individuals with kidney stones visited healthcare centers, hospitals, and charitable organizations related to kidney disease for services and treatment. Due to the lack of precise statistics on the number of individuals with and without kidney stones in Isfahan, the sample size was calculated using the formula for an infinite population. Based on a 95% confidence level and a standard deviation of 0.5, the sample size was estimated to be 384 for the group with kidney stones and 384 for the group without kidney stones. Purposive sampling was used, selecting individuals who met the inclusion criteria. Participants were interviewed about the inclusion criteria, and those who met the criteria completed the research questionnaires. Thus, 384 individuals with kidney stones and 384 individuals without kidney stones from Isfahan responded to the research questionnaires.

Inclusion Criteria

The inclusion criteria for this study were: willingness to participate in the research; being between the ages of 20 and 50; at least basic literacy to answer the questionnaire items; and a minimum of three months having passed since the first visit to a urologist (for the kidney stone group).

Exclusion Criteria

The exclusion criteria were: having chronic or metabolic diseases, including various types of diabetes; undergoing dialysis; and having severe psychiatric disorders alongside kidney stone disease.

Data Collection Methods

Data for this study were collected using both library research and field methods.

Research Tools

The tools used in this study included: The Fisher's Body Image Scale (FBIS), the Scale Empowerment-Short Form (ES-SF), and a researcher-developed demographic questionnaire. The Fisher's Body Image Scale (FBIS), created by Fisher in 1970, consists of 46 items. Each item is rated on a scale from 1 to 5 (Very Dissatisfied = 1, Dissatisfied = 2, Neutral = 3, Satisfied = 4, Very Satisfied = 5). A score of 46 indicates a disorder, while scores above 46, up to a maximum of 230, indicate no disorder. The areas assessed in this test include the head and face with 12 items (questions 1 to 12), upper limbs with 10 items (questions 13 to 22), and lower limbs with 6 items (questions 23 to 28). The remaining 18 items assess the respondent's attitudes toward general body features (questions 29 to 46). The validity of this test has been reviewed by Yazdanjou in Iran. The Pearson correlation coefficients calculated for the test's first and second administrations were 0.81 for first-year students, 0.84 for second-year students, 0.87 for third-year students, and 0.84 for all students combined. Based on the significance level of these coefficients, it can be accepted that there is a significant correlation between the scores from the first and second administrations of the body image test ¹¹. In the study by Nazarpour and Khazaei (2012), the reliability and validity of the body image questionnaire were calculated using three methods: Cronbach's alpha, Spearman-Brown coefficient, and Guttman's split-half coefficient, yielding values of 0.918, 0.861, and 0.861, respectively.

The Empowerment Questionnaire was designed in English by the Michigan University Training and Research Center in 2000. Its short form is an 8-item tool based on a 5-point Likert scale, aimed at assessing the management of psychological-social aspects of the disorder, evaluating dissatisfaction and readiness for change, and setting and achieving goals (Anderson, Fitzgerald, Gruppen, Funnell & Oh, 2003). Respondents choose one of the numbers 1 to 5 (Strongly Disagree = 1 to Strongly Agree = 5) for each question. The total score of the questions constitutes the final score, ranging from 8 to 40, with a higher score indicating a higher level of empowerment. This tool, with some word modifications, was previously used by Tsay and Hung (2004) and in Iran by Royani et al. (2013) for renal and hemodialysis patients; they reported Cronbach's alpha coefficients of 0.93 and 0.86 for its reliability. The face and content validity of this questionnaire were also confirmed by 10 professors and faculty members from Mazandaran University of Medical Sciences and the Shahid Beheshti University of Medical Sciences Faculty of Nursing and Midwifery. Additionally, the reliability of this

questionnaire was confirmed in the study by Sadeghi and colleagues (2020) on 20 individuals using the test-retest method with a correlation coefficient of 0.91 ¹².

Research Implementation Process: Initially, the necessary permissions for conducting the research were obtained. Then, considering the type of research, the sample size was determined to ensure valid and scientific answers to the research questions. As mentioned, using the formula for an infinite population, 384 individuals were estimated for the kidney stone group and 384 for the non-kidney stone group. The samples were selected purposefully and, after initial evaluation, underwent tests, interviews with a urologist, and completion of the research questionnaires. Individuals who met the entry criteria were selected, interviewed, and assessed, and then responded to the research questionnaires. For eligible individuals in both the kidney stone and non-kidney stone groups, interviews with a urologist and psychologist, and the "Fisher's Body Image Scale (FBIS)," "Scale Empowerment-Short Form (ES-SF)," and "Researcher-Made Demographic Questionnaire" were administered. The collected data were then analyzed and reviewed.

It should be noted that before distributing the questionnaires, explanations about the current research were provided to the participants, and they were assured that their information would remain confidential and that confidentiality would be maintained. Therefore, they could confidently and securely provide their information. Finally, all participants were thanked.

Statistical Analysis Methods

Statistical analysis was conducted using ANOVA (Analysis of Variance) and MANOVA (Multivariate Analysis of Variance). For the use of ANOVA, two assumptions were checked: normality of the data and homogeneity of variances. For the use of MANOVA, two assumptions were tested: homogeneity of correlations between research variables and comparison of the differences in dependent variables. To check data normality, the Kolmogorov-Smirnov test was used. Homogeneity of variances was assessed using Levene's test. Homogeneity of correlations between research variables was evaluated using the Mauchly's test, and for comparing differences in dependent variables, Wilks' Lambda, Pillai's Trace, Hotelling's Trace, and the Largest Root tests were employed.

Ethical Considerations

It is worth noting that this study was conducted following accepted scientific standards and adhering to the principles of the research ethics charter. It was presented

to the Central Headquarters of the Ministry of Health, Treatment, and Medical Education and was approved by the Faculty of Psychology and Educational Sciences at the University of Tehran on 01.02.2024 and received the ethical code IR.UT.PSYEDU.REC.1402.084. The online version of the approval is available and publicly accessible in the National Ethics System for Biomedical Researches of the Ministry of Health, Treatment, and Medical Education.

Results

The data analysis of the above research was performed using SPSS-24 and AMOS-24 software at both descriptive and inferential levels. The descriptive findings of this research include statistical indices such as mean and standard deviation. Before examining the above results, the tables related to the demographic information of the current study are provided.

Table 1. Distribution of Frequencies for Demographic Variables (Gender, Education, and Marital Status).

Demographic variable	Caregory	Patient		Non patient	
		Frequency	Frequency percentage	Frequency	Frequency percentage
Gender	Female	155	40/3	161	41/8
	Male	230	59/7	224	58/2
	Total	385	100	385	100
Education	Diploma	98	25/5	79	20/5
	Associate's Degree	28	7/3	53	13/8
	Bachelor's Degree	209	54/3	194	50/4
	Master's Degree	41	10/6	46	11/9
	PhD	9	2/3	13	3/4
	Total	385	100	385	100
Marital Status	Married	285	67	214	62/6
	Single	106	27/5	130	33/8
	Divorced	21	5/5	14	3/6
	Total	385	100	385	100

Table 2. Mean and Standard Deviation of Age.

Group	Mean	SD	Minimum	Maximum
Patient	38/80	9/16	20	50
Non patient	38/24	8/90	20	50

Next, the mean and standard deviation of the research variables will be examined.

Table 3. Mean and Standard Deviation of Body Image and Self-Empowerment in Patient and Non-Patient Groups.

Variable	Patient		Non patient	
	Mean	SD	Mean	SD
Body image	59/07	32/29	103/72	19/86
Self	17/15	7/50	26/43	5/90

Table 3. Mean and Standard Deviation of Body Image and Self-Empowerment in Patient and Non-Patient Groups.

Variable	Patient		Non patient	
	Mean	SD	Mean	SD
Body image	59/07	32/29	103/72	19/86
Self	17/15	7/50	26/43	5/90

Table 4. Kolmogorov-Smirnov Test Results for Checking Normality of the Scores of Research Variables.

Variable	Group	Kalmograph value	Significant level
Body image	patient	0/99	0/001
	Non patient	0/12	0/001
Self-Empowerment	patient	0/11	0/001
	Non patient	0/083	0/001

Table 6. ANOVA Results for Body Image and Self-Empowerment.

Variable	Sum of square	Degree of freedom	Mean of square	F	Significance level	Eta squared	Statistical power
Body image	383805/81	1	383805/81	534/04	0/001	0/41	1
Self-Empowerment	16579/64	1	16579/64	363/65	0/001	0/32	1

As shown in Table 6, based on the calculated F-values, there is a significant difference between the adjusted means of body image scores of participants based on group ($p < 0.01$, $F = 534.04$). Similarly, there is a significant difference between the adjusted means of self-empowerment scores of participants based on group (patient vs. non-patient) ($p < 0.01$, $F = 363.65$). Therefore, there is a difference in body image and self-empowerment scores between patients with kidney stones and non-patients, with these differences being 0.41 and 0.32, respectively. Observing the means of the two groups, in the body image variable (non-patient: 103.72 and patient: 59.07) and in the self-empowerment variable (non-patient: 26.43 and patient: 17.15), it is evident that body image and self-empowerment scores are higher in non-patients compared to patients.

As seen in Table 4, since the Kolmogorov-Smirnov test values for body image and self-empowerment variables are significant ($p > 0.05$), it can be concluded that these variables do not have a normal distribution. However, given that the sample sizes are large and equal, the F test is robust to deviations from parametric assumptions.

Table 5. Levene's Test Results for Checking Homogeneity of Variances in Research Variables.

Variable	F statistic variable	degree of freedom 1	degree of freedom 2	Significant level
Body image	12/20	1	768	0/001
Self-Empowerment	13/36	1	768	0/001

As observed in Table 5, the p-value for body image and self-empowerment variables is less than 0.05, indicating that the assumption of homogeneity of variances for these variables was not met ($p > 0.05$). However, considering that the sample sizes are large and equal, the F test remains robust to deviations from parametric assumptions¹³. To test the research hypotheses inferentially, ANOVA was used, and the results are presented in Tables 6 and 7.

Discussion

The results of this study indicated that there were significant differences between the patient and non-patient groups in terms of gender, education, marital status, and age. In terms of gender, there were slightly more men in both groups, but this difference was not statistically significant. However, educationally, the non-patient group tended to have higher levels of education compared to the patient group. Marital status showed a significant difference, with married individuals being more prevalent in both groups compared to single or divorced individuals. The average age of participants in both groups was within a similar range, though there was a slight difference between the two groups. Overall, the results showed that there were differences between patient and non-patient groups in terms of demographic variables.

Based on the analyses and results from the data, there was a difference between body image and self-empowerment scores in individuals with and without kidney stones. The level of satisfaction with body image and self-empowerment was higher and better in individuals without kidney stones compared to those with kidney stones.

There was a notable difference in body image scores between individuals with and without kidney stones, with non-patients showing higher satisfaction with their body image compared to patients. This indicates that when it comes to body image, significant differences exist between patients and non-patients. The non-patient group had higher scores in all aspects of body image satisfaction compared to the patient group. This suggests that non-patients may have a more positive and favorable perception of their bodies. Conversely, individuals with health issues may have more negative perceptions of their physical appearance and struggle with body image issues. This is an important finding because body image concerns can significantly impact an individual's mental health and overall quality of life ¹⁴. When body image negatively affects the delivery of healthcare, primary care physicians should consider these perspectives and adjust care plans accordingly. Thus, awareness of body image can influence care. Body image should be distinguished from "self-esteem" and "quality of life," as these latter concepts encompass not only appearance but also relationships, religious views, culture, occupation, and personal values. However, body image often affects self-esteem and quality of life, but changes in body image do not always reflect changes in self-esteem and quality of life, and positive self-esteem and good quality of life do not necessarily mean a positive body image. Analysis of the current study suggests that patients, especially when under the stress of illness, have a negative perception of their bodies, which is less prevalent in non-patients. This may be because life experiences, psychological conditions, medical conditions, and even some medications often lead to changes in appearance that can disrupt body image. Sometimes, causality can be reversed, with body image issues potentially leading to psychological disorders such as anorexia nervosa, bulimia nervosa, and body dysmorphic disorder, which in turn can negatively affect lifestyle, sleep, and eating habits, making individuals more susceptible to physical illnesses or exacerbating pre-existing conditions (e.g., kidney stones). Chronic kidney disease seems to be very challenging for both the patient and their family, as it leads to significant lifestyle changes, disability, reduced energy levels, the need for medication or surgery, and associated health issues that can affect the patient's ability to perform daily activities and disrupt their normal life.

Some patients might need to change their clothing styles, social interactions, and even sexual matters, making them feel physically different from others. This can result in a distorted body image and self-loathing, leading to reduced enjoyment of life. Additionally, according to the current study, patients with kidney stones face multiple body image disturbances due to changes from chronic kidney disease and potential treatment side effects such as skin discoloration, body odor from urea, infections, surgical scars, etc., making them more stressed compared to healthy individuals.

Furthermore, the results indicate that there is a difference in self-empowerment scores between individuals with and without kidney stones, with self-empowerment actions being higher and more desirable in non-patients. This suggests significant differences in self-empowerment between the patient and non-patient groups. Non-patients had higher scores in all dimensions of self-empowerment compared to patients. This indicates that non-patients may be more active in managing their health and well-being. It implies that individuals with health issues might feel less empowered and less in control of their lives. This finding is crucial because self-empowerment plays a significant role in enhancing resilience and coping with health challenges ¹⁵. Self-empowerment includes patient independence, ensuring proactive self-care, and having a sense of control over one's life. Engaging in self-empowerment activities leads to better health progress and reduced costs and is even associated with significant improvements in kidney stone disease management. However, it seems that kidney stone patients evaluate negative events and other life circumstances differently from non-patients, experience negative emotions more intensely, and consequently face greater distress and stress regarding their health. These issues can affect their physical and psychological health and impact self-empowerment actions positively or negatively. Additionally, it may be the case that individuals with chronic conditions like kidney stones become fatigued and mentally exhausted from maintaining self-care decisions and activities, potentially affecting their self-efficacy and self-management in physical health and performance. In some cases, these individuals might not prioritize their kidney stone disease or take effective health decisions and actions, which would lower their self-empowerment scores compared to non-patients. Moreover, it appears that non-patients make better and more desirable health-related decisions and actions, including self-efficacy, self-management, stress and anxiety reduction, improved quality of life, self-capacity, and better physical performance, compared to individuals with kidney stones. As mentioned, self-empowerment is a process through which individuals gain

more control over decisions and actions affecting their health, which can be achieved through skill development, access to information and resources, and influencing factors impacting their health. Thus, in chronic conditions, the ability to make decisions that reduce pain is very useful for long-term adaptation to pain.

Overall, the study underscores the importance of addressing physical and mental health issues, psychological well-being, body awareness, and self-empowerment among patients. Results from other studies also support these findings. Patients with kidney stones report lower physical and mental quality of life (QOL) compared to healthy adults. Furthermore, preventive strategies require patients to make significant changes in beliefs, cognition, decisions, behaviors, and lifestyle. Due to stagnation in medical management, there is a need for new interventions, particularly those designed to address reduced quality of life ¹⁶. These results highlight specific differences in health and well-being between patient and non-patient groups, emphasizing the importance of addressing these differences in healthcare interventions and treatment approaches. The findings emphasize the importance of promoting self-empowerment actions and positive body image beliefs among patients with kidney stones to improve their overall health and well-being and underline the need for targeted interventions to enhance self-empowerment and body image in these patients. Continuous educational programs should be regularly planned and provided for kidney stone patients, as they face various psychological challenges. Adequate education and information about appropriate coping techniques, maintaining social relationships, continued social and family support, and developing health policies to prevent and provide necessary services and support are essential.

Conclusion: Based on the current study, the results can be used to promote proper self-empowerment models, improve mental health, and address psychological issues in kidney stone patients. Urologists, in collaboration with health psychologists, clinical psychologists, and psychiatrists, can help patients reduce physical and psychological side effects of the disease, thus lessening its impact on their lives. It should be noted that this study was conducted in the medical centers of Isfahan in 2024, so caution is advised when generalizing results to other hospitals, clinics, and research institutes. Additionally, responses to kidney stone disease can vary not only across different societies but also within different groups in the same society. It is also recommended that high-risk individuals with kidney stones seek consultation and treatment from a urologist to prevent related issues.

Highlights

What Is Already Known?

Kidney stones are a common disease that affects psychological dimensions beyond physical complications. Body image and self-empowerment, two key factors in mental health and quality of life, can be affected by this disease. People with kidney stones may experience negative body image and a reduced sense of control over their lives due to physical changes or limitations. However, limited research has examined these two variables simultaneously in this population.

What Does This Study Add?

This study aimed to compare body image and self-empowerment in people with and without kidney stones. The results of this study can help to better understand the psychological challenges of patients and develop more effective support interventions to improve their quality of life.

Authors' Contributions

All Authors designed and directed the project; Fatemeh Tavakoli and Iman Ghanaat performed the experiments; Gholam Ali Afrooz and Hamid Kazemi-Zahrani analysed spectra; all authors developed the theoretical framework; Fatemeh Tavakoli wrote the article.

Acknowledgements

The authors would like to thank all the doctors and medical staff for helping and cooperating. Special gratitude should go to the patients who participated in this study. This study has been derived from an Ph.D. thesis approved by Tehran University, Iran.

Conflicts of Interest Disclosures

There are no conflicts of interest.

Consent For Publication

All authors consent to publish the article.

Ethics approval

The present study, is following of Committee on Publication Ethics (COPE) and complies with the highest ethical standards in accordance with ethical laws, and following the accepted scientific standards and observing the principle of "Ethical Code of Research", was proposed in the Research Council Commission for Research Development Management, Research Evaluation, and Coordination of Research Centers of Tehran University and was accepted on 2 January, 2024 and received the ethical code of IR.UT.PSYEDU.REC.1402.084 from University of Tehran.

Funding/Support

There is no financial support and sponsorship.

The extent of AI use

Nothing

Reference

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