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Original Article

Adjustment to a New Heart: Concept Analysis Using a Hybrid Model

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Abstract

Background: Although the phenomenon of adjustment to a new heart in transplant recipients is very complex, very few studies have been conducted on this important issue. Therefore, no careful and clear definition exists for this concept. **Materials and Methods:** This concept analysis was conducted in Iran in 2018 on 13 patients undergoing heart transplantation. In the theoretical phase, a conceptual framework was created according to the existing data in the literature about the phenomenon. In this study, 13 participants were selected using purposive sampling with maximum diversity. In the fieldwork phase, 20 deep and semistructured interviews were conducted with patients undergoing heart transplantation over 4 months. After data saturation, interviews were analyzed using the qualitative content analysis method proposed by Granheim and Lundman (2009). At the final analytical phase, the results of the two previous phases were integrated using a hybrid model. **Results:** Adjustment to a new heart is a unique multiphase process in patients undergoing heart transplantation. The antecedents include the transplantation time, physical conditions, social and family support, relationship with congeners, and spiritual beliefs. The desirable consequences of adjustment to a new heart may include a new life, inner peace, and spiritual excellence, and the undesirable consequences may include psychological abuse and emotional stagnation. **Conclusions:** According to the results, the health-care team should consider the patient as a unique client and initiate discussions before and following heart transplantation that address patients' adjustment to a new heart in all their physical, sexual, and emotional aspects.

Keywords: *Adjustment, concept formation, heart transplantation, Iran*

Introduction

Heart transplantation is an important life event that can lead to psychological, social, Quality of Life (QOL), and body image changes.[1] Patients who undergo organ transplantation may feel changes in emotions, tastes, and senses. These changes are stronger and more serious for heart transplantation candidates, and sometimes, they are consistent with the feelings of the donor.[2] A study by Abbey *et al*. showed that heart recipients are always concerned about the donor and his/her family and have fundamental emotional challenges in this regard.[3] In terms of mental aspects, heart transplantation for patients is more than a surgery, because before the surgery, they face this reality that they are waiting for the death of somebody who will be the candidate for donation due to disease, suicide, or accident but is still alive; thus, the recipients feel guilt and shame.[4] Patients are afraid of losing their previous personality and taking on the traits of the donor.[5] The results of different studies have shown that patients are afraid of taking on the traits of the donor and feel "reborn." Some patients do not feel ownership over the organ and state that the received heart is alien to them.[6] Some scientists believe that a new heart may cause important physical and mental changes, but these changes are not that extensive to cause deep changes in personality.[7,8] Almgren *et al*. stated that due to dependence and problems before transplantation, health level and QOL of people improve after transplantation, and changes in peoples' attitude and lifestyle are consistent with their new life conditions.[9] The results of studies are different in this regard. These differences can be due to cultural-religious differences in different countries, personalities, and familial and social circumstances.[10] After transplantation, patients deal with different comparative roles such as losing a heart, psychological perception of the transplanted heart, and mental concerns about death and rebirth, feeling of guilt, and personality

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How to cite this article: Asgari P, Jackson AC, Bahramnezhad F. Adjustment to a new heart: Concept analysis using a hybrid model. Iran J Nurs Midwifery Res 2021;26:89-96.

Submitted: 16-Mar-2020. **Revised:** 29-Apr-2020. **Accepted:** 29-Dec-2020. **Published:** 05-Mar-2021.

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Access this article online

Website: www.ijnmrjournal.net

DOI: 10.4103/ijnmr.IJNMR_9_20

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changes. These mental changes influence patients' adherence to the treatment program, and pathogenicity and mortality.[11]

Cultural, religious, and social factors influence individuals' feelings and personality. Nurses should teach patients according to their cultural and social conditions. Therefore, it is necessary for nurses as the main instructors before and after transplantation to have sufficient knowledge about this issue and to give appropriate answers to the questions and concerns of patients.[12] Awareness of mental issues and emotional compatibility processes among patients due to receiving a new heart leads to deeper recognition of these patients in performing facilitative interventions.[13] Although the concept of adjustment in patients undergoing heart transplantation is an important issue in nursing, no specific attention has been given to it and only a limited number of studies have been conducted on this topic. For example, Anthony *et al*., in their qualitative study, illustrated that many of the participants reported emotional and psychological concerns regarding accepting a foreign heart as their own;[2] however, no clear and accurate definition exists for it. Since the experiences after heart transplantation are diverse among different patients and each patient experiences compatibility with a new heart differently, there is ambiguity and complexity about the concept of adjustment to a new heart.[10] A concept such as adjustment is dependent on values, culture, and behavior and each person has a different understanding of and definition for this concept in different situations.

Concept analysis is a tool for concept clarification that leads to distinction and clarification of a concept.[14] As heart transplantation is an unique phenomenon that is complicated with lived experiences of patients, the hybrid method of concept analysis that is based on the review of the participants' experiences can provide important information about the concept.[15] Since no study has been conducted with the goal of explaining this phenomenon, it is necessary to understand different perspectives of patients and clarify this concept. Accordingly, the present study was conducted to clarify the concept of adjustment, and its features, antecedents, and consequences from the perspectives of patients in the Iranian nursing context using the hybrid model.

Material and Methods

The present research is a qualitative concept analysis conducted using a hybrid method on heart transplant patients during March 2019 to January 2020. In concept analysis, concepts that are not completely clear are explained, clarified, and made understandable.[13] Since heart transplantation is a deeply human and individual experience, the lived experiences of patients were gathered in this study. Therefore, it seems that the fieldwork along with theoretical review can depict a comprehensive picture of adjustment among these patients. This model includes the theoretical phase, fieldwork phase, and analytical phase.[16] The theoretical phase includes concept selection, review of literature, dealing with concept definition, and providing a definition. One of the most common methods for concept selection in a hybrid model of concept analysis is the consideration of clinical issues that nursing scholars deal with in teaching environments.[17] In this study, the concept of adjustment in patients undergoing heart transplantation was selected for analysis. In this phase, a systematic method was used according to York University Guidelines. This guideline includes selecting review questions, inclusion criteria, search strategy, study selection, data extraction, quality assessment, data synthesis, and dissemination plan.[18] In the theoretical phase, literatures published on adjustment to a new heart were searched in PubMed, ScienceDirect, ProQuest, Web of Science, and CINAHL, without a time limitation, using the keywords heart transplantation, personality change, and emotional adjustment. To combine the keywords, advanced search options were used in all databases. A total of 457 articles were found. Then, the articles were considered in terms of inclusion criteria (studies in the Persian or English language with related keywords in the title, abstract list of keywords) and exclusion criteria (articles in other languages). After deleting duplicated and irrelevant articles, 13 articles remained. These articles were reviewed thoroughly. A summary of the selected articles is presented in Table 1.

To begin the analysis, the articles were carefully read several times. The process of data extraction continued until data saturation was reached. The purpose of the fieldwork phase was to enhance and refine the intended concept that is formed in the text review phase. This phase was performed through clinical data collection and the participation of patients. In this study, 13 participants were selected using purposive sampling with maximum diversity (i.e., age, gender, marital status, occupation, and transplantation duration). Table 2 shows the characteristics of the participants. The inclusion criteria included rich clinical experiences and willingness to convey those experiences in the form of an interview. The time and place of the interview were selected according to the preference of participants (12 participants at the heart clinic and 1 participant at home). Sampling continued until data saturation (20 interviews). The main data collection method was interview and observing of nonverbal behaviors. After receiving oral and written informed consent from participants, interviews were conducted as semistructured interviews for 45–60 min (47.5 min on average) using information resulted from the theoretical phase. An interview guide was used that included a general question ("How do you feel about receiving a new heart?") and follow-up questions, to achieve the main criteria (such as "Can you further explain?" and "Can you clarify your point?"). After each interview, the texts

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Table 1: Overview of included articles in the theoretical analysis phase related to the concept of adjustment to a new heart

No.	Title	Author (year)
1	Spiritual experience in heart transplant recipients in Ira. *Cardiovascular Nursing Journal*	Raiesdana *et al*. (2013)[25]
2	Does changing the heart mean changing personality? A retrospective inquiry on 47 heart transplant patients	Bunzel *et al*. (1992)[5]
3	The meaning of being in uncertainty after heart transplantation-an unrevealed source to distress	Almgren *et al*. (2017)[9]
4	Changes in heart transplant recipients that parallel the personalities of their donors	Pearsall *et al*. (2000)[23]
5	Another person's heart: magical and rational thinking in the psychological adaptation to heart transplantation	Ispector *et al*. (2004)[26]
6	Somebody else's heart inside me: a descriptive study of psychological problems after a heart transplantation	Kaba *et al*. (2005)[27]
7	Qualitative interviews versus standardized self-report questionnaires in assessing quality of life in heart transplant recipients	Abbey *et al*. (2011)[3]
8	The Meaning of Surviving Three Years after a Heart Transplant-A Transition from Uncertainty to Acceptance through Adaptation	Lindberg *et al*. (2020)[28]
9	Experiencing heart transplantation: the patients' perspective	Stolf *et al*. (2006)[20]
10	Feelings of indebtedness and guilt toward donor and immunosuppressive medication adherence among heart transplant (HT×) patients, as assessed in a cross-sectional study with the Basel Assessment of Adherence to Immunosuppressive Medications Scale (BAASIS)	Shemesh *et al*. (2017)[11]
11	Uncertainty after heart transplantation. A new perspective on self-efficacy and self-management	Almgren (2018)[10]
12	The Heart as a Transplanted Organ: Unspoken Struggles of Personal Identity Among Adolescent Recipients	Anthony *et al*. (2019)[2]
13	The outcomes of heart transplantation: A qualitative study	Dehghan-Nayeri *et al*. (2017)[22]

Table 2: Characteristics of participants (*n*=13)

Characteristics	*n* (%)
Gender	
Male	7 (53.84)
Female	6 (46.15)
Marital status	
Married	9 (69.23)
Unmarried	4 (30.77)
Education	
Prediploma education	4 (30.77)
Diploma	6 (46.15)
Bachelor's degree	3 (23.07)

were transcribed and printed immediately. Then, using conventional qualitative content analysis, the texts were analyzed and this led to the emergence of the main categories or criteria. After several reviews, the texts were divided into their constitutive meaning units, and then into their smallest meaningful units. To validate the data, the criteria of acceptability, reliability, verifiability, and transferability were used.[19] Data acceptability was ensured through constant involvement in the topic and data. The patients' opinions about the text of the interviews and extracted codes were used. In sample selection, necessary diversity was taken into consideration. To ensure data reliability, a supervisor familiar with qualitative research and clinical environment was selected to investigate data and determine consistency between process and data. To ensure verifiability of findings, all activities were recorded carefully. Moreover, in order to ensure data transferability, the researcher shared the research findings with two patients who had not participated in the study to confirm the findings according to their experiences. The third phase of the hybrid model of concept analysis is integration of theoretical analysis with the insight resulted from empirical observations, interviews, and findings.[13] The data obtained from the theoretical and fieldwork phases were integrated. In other words, the results of the theoretical and fieldwork phases were compared with each other, the similarities and differences were determined, and a new definition of the concept was presented. At this stage, a combination of theoretical and experimental findings was analyzed in order to determine the characteristics of the concept and provide a new definition for it. Therefore, at the final analytical phase, features, facilitative factors, inhibitory factors, and consequences of the theoretical phase and fieldwork phase were compared, similarities and differences were identified, and a new definition was provided for the concept.

Ethical considerations

This research proposal was approved by the ethics committee of Tehran University of Medical Sciences, Iran (IR.TUMS.VCR.REC.1397.809). Informed written and oral consent was obtained from each participant before the study began. The principles of confidentiality and anonymity were explained to each participant.

Results

In this study, the mean (SD) age of the participant was 5.92 (6.03) years and the average number of years since their transplantation was 5.92 (6.03) years.

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Theoretical phase

Features and concept definition

A unique experience: In previous studies, adjustment to the new heart is mentioned as a unique experience for recipients. The feeling of life for yourself and death for the donor, death and a new life, the feeling of lack of confidence and loss of uniformity, changes in body image, receiving a gift from God, and relaxation are among the important feelings experienced by the participants.

Multistage process of compatibility with the new heart: Compatibility with the new heart includes the seven stages of transplantation need diagnosis, assessment, waiting list, presurgery period, recovery at the hospital, discharge, and post-discharge period. Patients undergoing transplantation have different spiritual understandings of the new heart for many years, and in each stage, they use different comparative methods for compatibility with the new heart.

Antecedents

Personal features: Attention to individuality and defensive mechanisms and compatibility skills regarding the new heart are important and provide the context for concept development.[20]

Family and social support: The roles of the patient and their families after transplantation, relationship with other patients undergoing transplantation, relationship with the treatment team, follow-up, and mental assessments after transplantation are supportive factors[21] and influence emotional adaptability of patients after surgery and also compatibility with transplantation conditions.[5]

Mental states before surgery: Mental disorders before surgery such as depression and anxiety.

Consequences

Emotional adaptability: The result of adjustment in transplantation patients includes reduced depression and anxiety, increased life expectancy, improved compliance with the treatment plan, increased QOL, and reduced morbidity and mortality.[5,9]

Returning to normal life: The final outcome of adjustment to the new heart in transplantation patients is returning to normal life and living like a healthy person.[22]

At the theoretical phase, according to reviews, the definition of adjustment to the new heart emerged. Adjustment to the new heart is a multistage emotional process that patients undergoing heart transplantation experience depending on mental states before transplantation, personal characteristics, and support from the treatment team, family, and society.

Fieldwork phase

Concept features

The features of adjustment that resulted from interviews showed that the feelings of participants regarding the new heart differ over time. At this phase, concept features appeared in two categories. The first category included the subcategories of "spiritual turmoil," "feeling of duality," and "self-acceptance." The second category was integration with the subcategories of "physical adjustment," "sexual adjustment," and "emotional adjustment."

The subcategory of spiritual turmoil appeared with "feeling of guilt," "feeling of guilt and indebtedness," "an alien heart," and "thanksgiving." At this phase, the critical conditions caused by heart disease for patients were eliminated and a new fight for returning with presurgery conditions started. At this phase, patients faced new problems.

Feeling of guilt was the first theme of this category. Many patients were feeling guilty because they received a heart from another person. A 60-year-old man who had received a new heart 7 years ago stated: "*although doctors told me the donor was brain dead and could never come back to life, I felt guilty during the first months following transplantation. I felt as if God had killed that person to keep me alive. I hated myself*" (Participant 9).

Feeling of guilt and indebtedness was the second theme of this category. After receiving a new heart and restarting life, participants considered themselves indebted to the donor. Participant 5 said: "*at the beginning, I was always thinking about Zeynab's heart (the donor). I would tell myself you are alive and she is dead. One day I was thanking God for giving me a new life and another day, I was sad that someone is dead and I am living instead of her. Some days, I would talk to her for hours and appreciate what she has done*" (Participant 5).

The next theme in this category was an alien heart. Participants considered their new heart as an alien organ and stated that a new organ is added to their body that feels strange. "*After transplantation, I had a strange feeling thatI had never before experienced. I was feeling that I know the source of energy for many years. I knew it was my body, but something strange had been added to my body. I thought that I have two control centers that are against each other. It was a kind of duality. I thought this may be due to my new heart*" (Participant 13).

Thanksgiving was the last theme in this category. All participants stated that after transplantation and a new opportunity for life, they appreciated God. They considered the new heart a gift and merci from God. "*On the first days following transplantation, I became more faithful to God and more religious. I am always prostrating before god and appreciating God for this divine gift. For the new life that God has given me, I have tried to avoid bad acts. In this condition, the person becomes more religious*" (Participant 12).

The next subcategory was the feeling of duality that included "change of personality" and "change of life

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habits." After receiving the new heart, some participants felt change in interests, spirit, and personality. Some of them after talking with the donors' families found out that their changes are consistent with the personality of the donors.

Another participant, a 37-year-old woman who received a new heart 3 years ago, stated: "*after the surgery, I became more mild-mannered. In the past, in Ashura, people were crying, but I could not cry at all. Now, on Ashura evening, I cry a lot. I believe that the donor was a religious girl and that has influenced me. That is why I have become so religious*" (Participant 8).

In this regard, one patient, who was a 28-year-old woman and received a new heart 20 months ago, stated: "*after the surgery and while recovering, I felt something has happened to me. I had a new feeling. During my life, I had never eaten lettuce and cabbage, but in those days, I wanted to eat a lot of lettuce and cabbage. My favorite color was red, but suddenly I became interested in gentle colors such as cyan and turquoise*" (Participant 4).

The next subcategory was self-acceptance that appeared with "accepting the new heart," "emotional adjustment with the donor," and "normalization." Over time, participants resolved their internal conflicts and considered the new heart as a part of their soul and integrated with it.

A 55-year-old man who received a new heart 6 years ago stated: "*gradually, my life affairs became normal. I feel it has become a part of my body and soul. Six years have passed and I am involved in life and my children. Over time, a person gets accustomed to everything. Time solves everything, and at least, normalizes everything for you. Sometimes, I cannot believe that I have undergone transplantation*" (Participant 5).

Another participant who received a new heart 11 years ago stated: "*now, I think it is mine. I feel it has become a part of me over time. Now, after 11 years, I do not have that feeling. I cannot say that I have forgotten everything, but I feel it is my heart. I always pray for the donor, may her soul rest in peace. Her parents are like my own parents to me. I am a member of their family*" (Participant 8).

The second category resulted from the analysis of interviews was integration that included feeling together with the donor in the physical, sexual, and emotional domains.

Physical adjustment

About physical adjustment, one participant, a 28-year-old woman who received a new heart 20 months ago, stated: "*I am not saying that my heart transplantation was a new life for me. I believe someone's heart and my body have been combined and a new person has been created. Two humans have been integrated and one is resulted that is me in front of you*" (Participant 4).

Furthermore, a patient, a 57-year-old woman who received a new heart 6 years ago, stated: "*when the donor's family members visited me, they said that we are similar to each other in terms of skin color, face form, eyes, and eyebrows. Her mother said it seems as though you are her sister*" (Participant 1).

Sexual adjustment

Some participants stated that with the new heart, they received the sexual features of the donor. In this regard, one of the participants stated: "*since I have received a man's heart, I feel more brevity. I understand men better. Even my family members have told me that I am like boys*" (Participant 10).

Emotional adjustment

After receiving a new heart, most of the participants created an emotional relationship with the donor; they even talked with them during life problems and considered the new heart a part of their emotional existence. "*I bet you cannot believe that when I get anxious, I chew my nails and I know that Maryam (the donor) was the same. Indeed, I received it from Maryam. I am integrated with Maryam. I promised to promote her. I told Maryam you should be the best. For this reason, I work on nail chewing, and instead, I read the Quran*" (Participant 4).

Concept antecedents

Transplantation time: People's feelings regarding the transplanted heart are dependent on transplantation time. Patients at different times after transplantation have different feelings about the new heart. They need time to adapt to the new conditions following transplantation. A 43-year-old man who received a new heart 2 years ago stated: "*after transplantation, I had a strange feeling. Sometimes, a unfamiliar condition feels familiar, but I am not like those days because I have gotten used to this situation*" (Participant 12).

Life conditions following transplantation: Life conditions following transplantation include "physical conditions," "social support," "family support," and "relationship with congeners" are the antecedents of emotional adjustment to the new heart.

Physical conditions

Improvement of physical conditions after transplantation influences the acceptance of the new heart and adjustment to it. A 23-year-old man who received a new heart 7 years ago stated: "*before transplantation, I could not walk because of shortness of breath. I was always at home. After transplantation, I felt real breathing. I regained my health, I went to university, I married, and I got my driving license. My whole life changed. These are all because of Abdollah*" (Participant 7).

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Family support

Since patients spend most of their time with their families, they need complete support from them.

A 26-year-old man who received a new heart 1 year ago stated: "*my family members were with me all the time. Otherwise, I would have died. My mother says God loves you because he has put you through this way. I am not depressed any more. My father opened a shop for me and I am working there, like others. I really appreciate what they have done for me*" (Participant 2).

Social support

Patients after transplantation need support from treatment personnel, friends, relatives, and even media. One of the participants, who was a 28-year-old woman and had received a new heart 11 years ago, stated: "*I underwent transplantation in 2007 and the Iranian National TV created a documentary about us and arranged a meeting between me and the donor's family. It was a wonderful feeling. Since that time, we have been connected and it is very good for the families to know each other*" (Participant 11).

Moreover, another participant stated: "*after transplantation, I experienced intense anxiety and depression. I believed I deserved to die and the donor had the right to live. I was so sad. I went to visit the doctor and he introduced me to a psychologist. After several sessions, I felt relaxed*" (Participant 10).

Relationship with congeners

Patients' relationship with each other leads to sharing of experiences and understanding mental and spiritual issues after transplantation. "*We (a group of people who have undergone transplantation) have a chatroom on telegram and everybody shares his or her experiences. It is wonderful. Those who have undergone transplantation say that after transplantation, the person becomes so excited and feels like he/she has a new life, and sometimes, feels the donor's personality. However, after that you get involved in life, forget many things, and get used to it*" (Participant 13).

Spiritual beliefs

Trust and belief in God were among the other important elements frequently pointed out by participants. "*God is the one who takes care of us. I think God has chosen me for this test. This disease was a divine test for me. God gave me a new opportunity, so I have to appreciate it and make fewer mistakes. I owe God and the person who gave her heart to me.*"

Concept Results

The results of adjustment to the new heart were divided into "desirable adjustment" and "undesirable adjustment."

Desirable adjustment

The desirable results of adjustment to the new heart included "starting a new life," "inner peace," and "spiritual excellence."

Starting a new life

Participants stated that a new heart is the symbol of a new life. A 32-year-old woman who had received a new heart 20 months ago stated: "*this heart for me is the symbol of change. I am changed with it and this means a new start. It is like a window onto a new world for me. However, I am well mentally and I do not have any psychological problems. There were only a few changes that were beyond my control. All I can do is to satisfy the real owner of this heart. I do not care what others think, whether they believe or not*" (Participant 3).

Inner peace

One of the results of adjustment to a new heart is inner peace. A 59-year-old man who received a new heart 8 years ago stated: "*Since totally recovering, my life has not been meaningless anymore. I am not like the first days and an inner peace has emerged inside me. My mood is much better and I have many plans for the future*" (Participant 4).

Spiritual excellence

Heart transplantation led to the acceptance of divine providence, getting close to God, and deepening of belief in God.

"I was not a very religious person, but after transplantation, I thought about God all the time. I wanted to pray. I believe that God tests those who he loves more. I really felt his presence in my life" (Participant 4). Furthermore, another participant stated: "*after transplantation, you see that God has given somebody else's heart to you. It seems that he has special attention toward both parties. It does not matter how far you have wandered, you will return to him. I got so close to him*" (Participant 3).

Undesirable adjustment

Undesirable adjustment included "psychological abuse" and "emotional stagnation."

Psychological abuse

After receiving a new heart and visiting the donor's family, some participants experienced psychological abuse and sadness. "*After the transplantation, the donor's family members hug me whenever they see me. They put their heads to my chest to hear the sound of the heart. It makes me feel so sad and guilty*" (Participant 12).

In addition, another participant stated: "*after the transplantation, I became more agitated and nervous. My family members do not dare to talk to me. I do not know what is wrong with me*" (Participant 9).

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Emotional stagnation

After the transplantation, some participants believed that all of their emotions and feelings were influenced by the new heart. In this regard, one of the participants stated: "*after the transplantation, I feel I have a control center that controls my actions and emotions. This means that I am a walking dead! I always feel that these emotions are not mine*" (Participant 3).

Final analytical phase

In this phase, the findings of the theoretical and fieldwork phases were compared with each other and the results showed that the process of adjustment to the new heart is different for each person. Since humans are unique creatures and have different individual understandings of phenomena, the findings of the theoretical phase are justifiable. Adjustment to a new heart is a unique and multistage process for patients undergoing heart transplantation. Its antecedents include transplantation time, physical conditions, social and family support, relationship with congeners, and spiritual beliefs. The desirable outcomes of adjustment to a new heart include a new life, inner peace, and spiritual excellence, and its undesirable outcomes include psychological sickness and emotional stagnation.

Discussion

The only definitive treatment for advanced heart disease is heart transplantation and the fact that patients, in addition to physical problems and side effects of drugs, may suffer from mental problems before and after surgery should be taken into consideration. One of these problems is adjustment to a new heart. The analysis of adjustment to a new heart led to the clarification of this concept and showed that this concept includes a vast spectrum of features, antecedents, and consequences. In this study, most of the theoretical phase findings were consistent with the findings of the fieldwork phase.

Participants pointed out that the passage of time caused emotional, physical, and sexual changes in them. In this regard, Stolf and Sadala stated that patients' feelings after transplantation included guilt or feeling of physical change for each recipient.[20] The results of a study by Kuhn *et al*. showed that heart transplantation is a multistage process, and in each process, people's feelings are different. Monitoring the patients over consecutive years following transplantation is crucial for their improvement.[21] Bunzel *et al*. pointed out that several patients believed that their changes in personality, emotions, and feelings after heart transplantation are due to the new heart. Therefore, changes in feelings and personality of heart transplant recipients should be taken into consideration.[5] Although heart transplantation is a treatment that increases life expectancy and QOL of patients, heart recipients experience mental and spiritual changes after transplantation. Therefore, in addition to periodic physical care, patients' mental and spiritual conditions should also be taken into consideration.[6] Pearsall *et al*. concluded that the awareness of recipients regarding changes in personality following heart transplantation is unknown, but according to cellular memory theory and its transmission with organ transplantation, patients who have undergone heart transplantation may experience nutritional, musical, and sexual changes.[23]

The consequences of the concept include life conditions after transplantation. As Rybarczyk *et al*. pointed out, after transplantation, relationship with other people and support from family, society, and the treatment team are very important and influence patient compatibility. Moreover, they concluded that discovery and treatment of compatibility problems of patients undergoing transplantation lead to mental adaptation, increased QOL, decreased morbidity, and decreased mortality.[24] Another concept consequence that was pointed out by participants was spiritual beliefs. Before the transplantation, all participants were between life and death and were hopeless. Therefore, after transplantation and gaining a new life, they wanted to do good things and believed that this is a gift from God. Raiesdana *et al*. concluded that belief in God and acceptance of divine providence cause more peace for patients undergoing transplantation. These patients experience a high level of spirituality that helps them overcome the consequences of transplantation.[25]

The results of adjustment were divided into desirable and undesirable aspects. Almgren *et al*. concluded that patients, after transplantation, face different comparative roles such as loss of their heart, mental understanding of the new heart, and mental concerns about death and rebirth.[9] Bunzel *et al*. stated that patients undergoing heart transplantation use different methods to adapt to the new heart. Compatibility with the new heart needs high degrees of power and skills. Otherwise, it may lead to depression, anxiety, and mental disorders after transplantation.[5] Moreover, Almgren *et al*. stated that some patients undergoing heart transplantation have experienced loss of uniformity and need time for compatibility.[10] Therefore, a multifaceted approach is needed to equip heart transplant recipients with the skills they might require to adjust to a new heart.

As to limitations of the present study, there was a lack of access to the full texts of all papers and essays at the theoretical phase. Moreover, the fieldwork phase of this study was on heart transplant patients in Iran and the data have been collected via interviews and analyses through the qualitative method. Therefore, it has the inherent limitations of qualitative methods in transferability.

Conclusion

According to the findings of this study, it can be concluded that features, antecedents, and consequences

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facilitate a better understanding of adjustment to a new heart. Awareness of this concept helps the health-care team to consider the patient as a unique client and, in addition to paying attention to and satisfying the physical needs of these patients, mental issues should be taken into consideration to provide them with necessary instructions to increase QOL and this is possible by gathering information and increasing knowledge. Systematic support and intervention is needed throughout the entire transplant process with ongoing assessment of recipients' physical, emotional, spiritual, and psychosocial well-being as part of routine clinical care. The findings of the present study can help develop a model and theory. Identifying the characteristics of the concept of adjustment with the transplanted heart can also help improve the care procedures provided for these recipients and can be used as a tool to assess, investigate, and expand the body of knowledge in this profession.

Acknowledgements

This study was derived from a proposal with the number 97-03-61-39824. The authors would like to thank all those who cooperated in the research project, especially heart transplant patients who kindly participated in the interviews and reported their valuable experiences.

Financial support and sponsorship

The study was funded by Tehran University of Medical Sciences

Conflict of interest

Nothing to declare.

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