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Original Article

Developing a Self-Care Pattern of Heart Valve Replacement Patients: A Grounded Theory Study

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Abstract

Objectives: Heart valve replacement patients require lifelong adjustments in medication, diet, and lifestyle to maintain a stable clinical condition. This ongoing need for self-management necessitates effective self-care behaviors. This study aims to develop a comprehensive self-care pattern specifically tailored for heart valve replacement patients.

Methodology: This qualitative grounded theory study was conducted in Iran, utilizing semi-structured interviews to gather data from January to April 2021. A total of 31 participants were included, comprising 13 heart valve replacement patients and 18 healthcare professionals involved in their treatment and care. Data analysis followed the grounded theory methodology of Strauss and Corbin, employing open, axial, and selective coding techniques.

Results: A distinctive self-care pattern for heart valve replacement patients was established, centered around the core category of "Personal Health Promotion Activities." Key components of this model include causal conditions such as "Self-Care Competence" and "Familiarity with Care Needs." Contextual conditions identified were "Social Support" and "Educational Effectiveness," while intervening conditions encompassed "Providing Care Strategies" and "Familiarity with Incidents." The strategic elements of self-care involved "Prevention of Dangerous Situations," "Adherence to Care Instructions," and "Moderate Lifestyle." The resulting consequences included "Self-Efficacy," "Reduction of Medical Costs," and "Achievement of Therapeutic Goals."

Conclusion: This study demonstrates that the phenomenon of self-care, framed as a personal health promotion activity, is influenced by a variety of factors. Strengthening these factors can enhance self-care practices among heart valve replacement patients, potentially mitigating surgical side effects and anticoagulant complications, ultimately leading to an improved quality of life.

Keywords: Self-Care, Heart Valve Replacement, Grounded Theory Study

INTRODUCTION

Cardiovascular diseases remain a leading cause of morbidity and mortality worldwide, accounting for a substantial burden on healthcare systems globally. Heart valve disease affects approximately 41 million people, making it one of the most common cardiovascular conditions requiring surgical intervention [1]. Heart a cement (HVR) is a widely accepted treatment option, particularly for patients classified as low to moderate surgical risk [2].

Heart valve pcome in two primary types: mechanical and biological. Mechanical valves are durable and have a long lifespan, but they are associated with a higher risk of thrombosis. Conversely, biological valves offer more natural hemodynamic properties and reduced thrombotic risk but tend to have a shorter lifespan [3]. Despite the benefits of nts face potential complications such as atrial fibrillation, bleeding, thrombosis, and gastrointestinal issues, all of which can significantly impact their quality of life and survival [4].

Given the high risk of these cos, anticoagulation therapy is essential following surgery. The current standard therapy involves the use of Vitamin K antagonists (VKAs), which are prescribed based on the International Normalized Ratio (INR) to ensure effective anticoagulation [5]. VKAs can significantly reduce the risk offts and improve patient outcomes, provided that the INR remains within a therapeutic range [6]. However, maintaining this delicate balance is challenging; get range increases the risk of bleeding, while an INR below the range heightens the likelihood of thromboembolic complications [7].

Several factors influence the effectiveness of VKAs and the risk of side effeing socioeconomic status, diet, concomitant medications, underlying health conditions, and patient knowledge and activity levels [8]. Consequently, patients undergoing HVR must be well-informed about these influencing factively engage in self-care practices to manage their condition effectively [9]. Evidence suggests that effective self-care among patients with cardiovascular conditions, such as re, improves psychological well-being, enhances treatment outcomes, reduces hospital readmissions, and lowers healthcare costs [10].

However, despite the known benefits of self-care, HVR patients often lack structured self-care guidelines, suboptimal self-management behaviors [11]. The need for a standardized approach to self-care in this patient population is critical to improving outcomes [12-14]. To addap, the present study employed a grounded theory approach to develop a comprehensive self-care model for patients undergoing heart valve replacement. Grounded theory is a qualitative research method widely used in nursing and healthcare that allows for an in-depth understanding of complex phenomena, providing actionable insights and guiding patient care strategies.

This study aims to establish a self-care framework that integrates various dimensions influencing patient behaviors and outcome facilitating the development of evidence-based guidelines to support HVR patients in achieving better health and quality of life.

METHODOLOGY

Design: According to Denzin and Lincoln (2011) [15], studies aiming to explore the processes underlying a phenomenon and to develop theoretical insights are best addressed using grounded theory. This study seeks to understand the self-care patterns of patients who have undergone heart valve replacement. Thus, we employed the grounded theory approach outlined by Strauss and Corbin [16], which is deemed the most suitable research methodology for our objectives.

Participants: Participants were recruited from the Farshchian Hospital at Hamadan University of Medical Sciences in Hamadan, Iran, between January and April 2021. The target group included heart valve replacement patients, as well as healthcare professionals involved in their treatment and care—such as surgeons, nurses, nutritionists, physiotherapists, clinical psychologists, and family members of the patients. Initially, participants were selected through purposive sampling, followed by theoretical sampling, which emerged from data analysis to explore relevant concepts.

The theoretical sampling reflects emergent theories and guides the research process [17]. The inclusion criteria for patients were: (1) being a heart valve replacement patient, (2) having a stable clinical condition, and (3) the ability to communicate

effectively with the researcher. For healthcare professionals, the criteria included: (1) willingness to participate, (2) familiarity with the concept of self-care, and (3) the ability to articulate their experiences effectively. Participants who withdrew from the study or were unable to convey their experiences adequately were excluded.

Table 1: Demographic Characteristics of Participants

Participant	Age	Gender	Education	Role
P1	51	Male	Sub-specialist	Surgeon
P2	45	Female	Master of Science	Nurse
P3	31	Female	Bachelor	Nurse
P4	35	Male	Bachelor	Nurse
P5	29	Female	Master of Science	Nurse
P6	41	Female	Bachelor	Nurse
P7	48	Male	Diploma	Patient
P8	42	Male	Diploma	Patient
P9	46	Female	Bachelor	Patient
P10	46	Male	Diploma	Patient
P11	62	Male	Illiterate	Patient
P12	38	Male	Diploma	Patient
P13	29	Female	Bachelor	Patient
P14	41	Female	Associate	Patient
P15	58	Female	Primary	Patient
P16	23	Male	Diploma	Patient
P17	44	Female	PhD	Physician
P18	36	Female	Bachelor	Nurse
P19	38	Female	Bachelor	Nurse
P20	39	Female	PhD	Rehabilitation Physician
P21	40	Male	Master of Science	Clinical Psychologist
P22	44	Female	Master of Science	Physiotherapist
P23	56	Female	Bachelor	Patient
P24	51	Male	Primary	Patient
P25	39	Female	Associate	Patient
P26	32	Male	Associate	Nurse
P27	46	Female	PhD	Physiotherapist
P28	48	Male	Sub-specialist	Surgeon
P29	62	Female	Diploma	Patient
P30	64	Male	Illiterate	Patient
P31	57	Female	Bachelor	Nurse
P32	41	Female	Master of Science	Nurse
P33	36	Female	Master of Science	Nurse
P34	55	Male	Illiterate	Patient
P35	45	Female	Diploma	Patient

Data Collection: Data were collected through semi-structured interviews conducted by two researchers, ShZ and BI, both experienced in qualitative research. The interviews followed a structured five-step plan (see Table 2), with the timing and location of each session arranged according to participants'

preferences. Each interview averaged 52 minutes, was audio-recorded, and subsequently transcribed verbatim. The selection of subsequent interviewees was informed by the analysis of prior interviews, and data saturation was reached after interviewing 35 participants.

Table 2: Interview Steps

Step	Description
I	Initial introduction: Researcher introduction and objectives
II	Start the interview with an open question: "What is life like after heart valve replacement?"
III	Specific and semi-structured questions: "What is self-care and related factors after heart valve replacement?"
IV	Probing: "Explain more. Could you elaborate on that?"
V	End of the interview: Acknowledgments and coordination for future meetings if necessary

Ethical Considerations: The study received approval from the Ethics Committee of Hamadan University of Medical Sciences (UMSHA), designated by code IR.UMSHA.REC.1398.294. Participants were thoroughly informed about the study's purpose, including the recording of their voices and conditions for participation. Assurance was provided regarding the confidentiality of personal information, and participants signed a consent form. To ensure anonymity, personal identifiers were replaced with coded identifiers.

Rigor: To establish methodological rigor, we adhered to the four standards outlined by Lincoln and Guba: credibility, transferability, dependability, and confirmability [18]. Data credibility was enhanced through prolonged engagement, follow-up observations, and maximum variability sampling. To ensure dependability, researchers were categorized into two groups, conducting independent investigations, while a third researcher with qualitative expertise monitored the study. The coding process maintained researcher impartiality, and a foreign researcher with relevant experience assisted in interpreting codes. Transferability was supported by providing detailed descriptions of the subjects, participants, data collection methods, and analysis procedures.

Data Analysis: Data analysis utilized the open, axial, and selective coding methods as delineated by Corbin and Strauss (2015) [19]:

1. **Open Coding:** Each interview was verbatim transcribed, reviewed, and analyzed phrase by phrase, identifying meaningful sentences as concepts. Thirteen initial categories were formed by grouping related concepts, leading to the development of 53 subcategories based on their characteristics and dimensions.
2. **Axial Coding:** Categories were interconnected through a paradigm model that illustrated the context, consequences, intervening factors, action/interactional methods, and causal conditions.
3. **Selective Coding:** The similarities and differences among coded concepts were systematically compared, increasing the level of abstraction and resulting in the formulation of an overarching core category. This core category revealed fundamental social-psychological mechanisms and ultimately led to the development of a substantive theory encompassing all categories and the core category (see Fig. 1).

RESULTS

This study involved 31 participants, comprising 13 heart valve replacement patients and 18 healthcare professionals involved in their treatment, care, and maintenance. Participants' ages ranged from 23 to 62 years, with a gender distribution of 13 women and 18 men. Among them, 11 were unmarried, and 20 were married. The educational backgrounds varied: 3 were illiterate, 4 had primary education, 3 had completed secondary education, and 21 were university graduates.

A Self-Care Pattern of Heart Valve Replacement Patients: From the data, thirteen categories emerged, which were integrated using Corbin and Strauss' (2015) paradigm model to formulate a self-care pattern for heart valve replacement patients (Figure 1).

Causal Conditions: Causal conditions explain the factors that give rise to a phenomenon. The primary causal conditions identified in relation to self-care among heart valve replacement patients included:

- **Self-Care Competence:** Patients need to possess personal competencies to adhere to care instructions. One participant stated, "When I was less addicted, one day of taking warfarin was enough for me, but now that my consumption

has risen again, my warfarin has increased by one and a half; I know this is due to the effects of addiction."

Familiarity with Care Needs: An understanding of care requirements is crucial for effective self-care. A patient noted, "The nurse told me to pay attention to the appearance of the wound and explained some of the symptoms. A few days after I went home, one of these small incisions hurt a lot. I suspected it might be an infection, so I went to the doctor quickly."

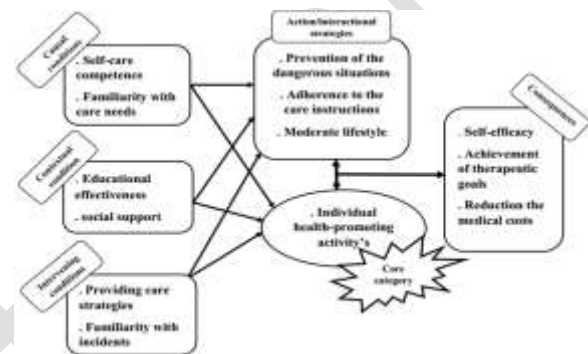


Figure 1: Self-Care Pattern of Heart Valve Replacement Patients

Contextual Conditions: Contextual conditions refer to the environmental and situational factors influencing the phenomenon. In this study, two primary contextual conditions were identified as significant in facilitating self-care:

- **Educational Effectiveness:** Effective education is vital for ensuring patients understand and implement care procedures. One patient remarked, "One of the nurses gave me training in simple terms, which I fully understood, leading me to follow all the points they mentioned."
- **Social Support:** Social networks play an essential role in supporting heart valve replacement patients. A participant shared, "When I went to the market, my friends would not let me lift heavy things. They would give me lighter tasks, showing their concern for my well-being."

Intervening Conditions: Intervening conditions encompass broader structural elements that facilitate or impede action. Two key categories emerged from the analysis:

- **Providing Care Strategies:** Familiarity with self-care strategies is essential. A patient expressed, "The doctor informed me about my heart rate while walking. I always checked my heart rate during activity."
- **Familiarity with Incidents:** Understanding potential incidents related to their surgery empowers patients to make informed decisions. A patient stated, "I would like to know about my treatment process before the operation. It's crucial to understand the postoperative conditions."

Action/Interactional Strategies: Action/interactional strategies are purposeful behaviors employed to address the issues arising from the phenomenon. The identified strategies for promoting self-care among heart valve replacement patients include:

- **Prevention of Dangerous Situations:** Patients must take proactive measures to avoid risky conditions. A patient noted, "I had bowel bleeding due to constipation, but now that I eat more high-fiber foods, I have less constipation."
- **Adherence to Care Instructions:** Following medical advice is critical in preventing complications. A nurse observed, "We had a patient whose operation was canceled due to an abnormal PT. The patient claimed they took all medications as usual, despite our instructions."
- **Moderate Lifestyle:** A balanced lifestyle is crucial for recovery. A surgeon cautioned, "Patients should maintain moderation in their lifestyle due to the risk of complications."

Consequences: The consequences of self-care are positive outcomes resulting from the application of action strategies. The study identified three significant consequences:

- **Self-Efficacy:** Empowered patients can meet their care needs independently. A patient mentioned, "Although I am illiterate, I can manage my medications without help now."
- **Achievement of Therapeutic Goals:** Self-care contributes to improved clinical conditions and quality of life. A patient shared, "I followed the care instructions and returned to my normal activities very soon."
- **Reduction of Medical Costs:** Effective self-care can lower healthcare expenses by minimizing

complications. A nurse remarked, "Patients who do not follow care strategies often incur more costs due to increased complications."

Core Category: The core category encapsulates the essence of the phenomenon, highlighting its central theme. This analysis reveals that effective self-care among heart valve replacement patients involves leveraging causal conditions, contextual factors, intervening strategies, and purposeful actions to enhance their health status. The core category identified was "Individual Health-Promoting Activities," reflecting the holistic nature of self-care practices.

DISCUSSION

This study presents a grounded theory-based self-care model for heart valve replacement patients, highlighting the complex interplay of individual health-promoting activities influenced by causal, contextual, and intervening factors. The model demonstrates that these factors, along with specific strategies, significantly impact the self-care practices of patients undergoing heart valve replacement.

The core category identified in this model is "Personal Health Promotion Activities," which serves as the central theme connecting various aspects of the self-care framework. This concept encapsulates the essence of self-care among these patients, as supported by Martinez et al. (2021), who described self-care as the ability to enhance, maintain, or promote health and well-being through self-awareness, self-control, and self-reliance [20].

The model identifies "Self-Care Competence" and "Familiarity with Care Needs" as causal conditions that give rise to the self-care phenomenon. According to Landim et al. (2011) [21], having self-care competence is associated with better knowledge, attitudes, and motivation towards self-care, and it is linked to resilience and stress management. Macabasco-O'Connell et al. (2011) [22] further demonstrated a direct relationship between knowledge, familiarity with care skills, and self-care behaviors in patients with heart failure.

Contextual conditions that support the self-care phenomenon include "Social Support" and "Educational Effectiveness." Social support has been

shown to enhance self-care abilities, as noted by Alizadeh et al. (2014) [23], while educational interventions have a positive impact on self-care behaviors. Effective education tailored to individual patient needs can significantly improve self-care outcomes [12].

Intervening factors such as "Providing Care Strategies" and "Familiarity with Incidents" are additional conditions that influence the development of self-care practices. Zandi et al. (2021) [12] found that educating patients on self-care strategies could help maintain PT and INR levels within therapeutic ranges, thus reducing secondary complications.

The model outlines key self-care strategies, including "Prevention of Dangerous Situations," "Adherence to Care Instructions," and maintaining a "Moderate Lifestyle." These strategies align with findings by Saadat et al. (2019) [24], who reported that a health-promoting lifestyle positively correlates with self-care behaviors [24]. Studies also suggest that patient education on self-care can significantly enhance these behaviors (Shendre et al., 2014) [25].

The consequences of implementing the self-care model for heart valve replacement patients are threefold: improved "Self-Efficacy," "Reduction in Medical Costs," and "Achievement of Therapeutic Goals." Research consistently demonstrates that effective self-care leads to increased self-efficacy and a reduction in healthcare dependency. For instance, Yu Sau Fung et al. (2019) [26] noted that appropriate self-care practices could reduce hospitalization rates among heart failure patients by up to 40%, significantly lowering treatment costs. Additionally, Zandi et al. (2021) showed that self-care among heart valve replacement patients helps maintain INR levels within target ranges and minimizes bleeding complications [12].

Limitations: This grounded theory study developed a paradigm model of self-care for heart valve replacement patients, characterizing the core concept of "Personal Health Promotion Activities" and its interconnections with various influencing factors. The model illustrates that the self-care phenomenon is shaped by causal factors ("Self-Care Competence" and "Familiarity with Care Needs"), contextual factors ("Social Support" and "Educational Effectiveness"), and intervening factors ("Providing

Care Strategies" and "Familiarity with Incidents"). The self-care strategies identified—"Prevention of Dangerous Situations," "Adherence to Care Instructions," and "Moderate Lifestyle"—lead to positive outcomes, including increased "Self-Efficacy," "Reduced Medical Costs," and "Achievement of Therapeutic Goals."

Health policymakers can use these findings to design infrastructure and educational programs that support the self-care efforts of heart valve replacement patients, ultimately improving patient outcomes and optimizing resource utilization.

CONCLUSION

This study highlights the significant role of age in the onset, clinical presentation, and outcomes of AVNRT and APMT. AVNRT predominantly affects older adults, while APMT is more commonly diagnosed in younger individuals. The high success rates of catheter ablation for both arrhythmias confirm its efficacy, but the increased recurrence rates in older patients necessitate more tailored, age-specific management strategies. Clinicians should consider age and comorbidities as key factors when developing treatment plans for patients with SVTs, particularly for those at higher risk of recurrence. Further research, particularly multicenter studies with extended follow-up periods, is essential to refine treatment approaches and improve long-term outcomes for all age groups.

AUTHORS' CONTRIBUTION

BI, SZ, and GS: Concept and design, data acquisition, interpretation, drafting, final approval, and agree to be accountable for all aspects of the work. BI, SZ, and GS: Data acquisition, interpretation, drafting, final approval and agree to be accountable for all aspects of the work.

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