

CASE STUDY

Nursing Process Based on Johnson's Behavioral System Model in Patients with Heart Failure: A Case Report

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Abstract

Heart failure is a complex clinical syndrome caused by the heart's inability to pump blood effectively. Managing this condition requires a comprehensive nursing care plan that addresses not only physical treatment but also the patient's psychological and social dimensions. This study aims to evaluate the effectiveness of Johnson's Behavioral System Model in the care of patients with heart failure. This case report focuses on an 88-year-old male patient with heart failure admitted to Fatemeh Zahra Hospital in Sari. Data were collected through observation, interviews, and review of the patient's medical records. The patient's behavior was assessed using Johnson's Behavioral Model Review Form, and relevant nursing diagnoses were established. Treatment goals were defined, and nursing interventions were designed accordingly. Initially, the patient exhibited unstable behaviors in four behavioral subsystems. Following the implementation of Johnson's Behavioral System Model-based nursing interventions, these behaviors improved, leading to greater balance in his environment. Applying Johnson's Behavioral System Model in the care of heart failure patients proved to be highly effective. This model enables nurses to identify patient needs and design appropriate interventions

Keywords Case Reports, Heart Failure, Models, Nursing, Nursing Process, Patient Care Planning

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1 Introduction

Heart failure is one of the major public health challenges in modern societies, exerting a profound impact on patients' quality of life.^[1] According to reports from the World Health Organization, it is considered one of the leading causes of mortality worldwide,^[2] and a considerable proportion of patients experience psychological complications such as anxiety and depression.^[3] Due to the heart's inability to pump blood effectively, this condition may result in symptoms such as dyspnea, fatigue, and limitations in daily activities.^[4] Heart failure affects not only the physical aspects of patients' health but also imposes significant psychological, social, and economic burdens, placing substantial pressure on healthcare systems.^[5] Patients with this condition often encounter serious challenges in performing daily tasks, highlighting the necessity of providing comprehensive and specialized care.^[6] Recent studies have shown that self-care education through various approaches, including virtual and feedback-based training, can significantly improve self-care behaviors among patients with heart failure and play an important role in enhancing their clinical outcomes.^[7, 8]

The use of nursing models in the care process for patients with chronic conditions can provide a structured framework for nurses to assess various patient conditions, analyze situations more effectively, and organize their thinking for optimal decision-making. If nursing goals are not developed based on valid models, nurses' time may be wasted, and the quality of care may be compromised.^[9] One of the significant models in nursing is Johnson's Behavioral Systems Model (JBSM). This model emphasizes a patient-centered approach and views the nurse's role as complementary to that of the physician.^[10] JBSM can assist nurses in identifying patients' physiological, psychological, and social needs and in designing appropriate care plans. Based on principles of understanding patients' behaviors and their interactions with the environment, this model enables the identification of both stable and unstable behaviors.^[11]

One effective method for implementing nursing models is through case studies, which enable nurses to design care plans tailored to the needs of patients with heart failure and their families.^[12-14] Overall, the treatment process for patients with heart failure requires particular attention, as the complexity and multidimensional nature of the disease demand comprehensive and specialized care. This study can serve as an important step toward applying JBSM in practice. It is anticipated that using a care plan based on this model will help maintain and enhance patients' stable behaviors while reducing unstable behaviors. Therefore, this study was designed to examine the impact of a nursing process based on the

JBSM in patients with heart failure.

This study is a case report. The study population comprised all patients with heart failure who presented to Fatemeh Zahra Hospital in Sari in 2025. Among these patients, one with heart failure was selected by convenience sampling and met the inclusion criteria. Inclusion criteria were age over 18 years, heart failure diagnosis confirmed by cardiologist, and informed consent to participate in the study. Exclusion criteria were patients younger than 18 years, those with unconfirmed diagnosis of heart failure, patients with severe cognitive impairment or inability to provide informed consent, and those unwilling to participate. After approval of the protocol by the Research Council of Mazandaran University of Medical Sciences and receipt of Ethical approval (IR.MAZUMS.REC.1404.040), the researcher visited Fatemeh Zahra Hospital with a written permission and an official introduction letter. Following an explanation of the study aims, written informed consent was obtained from the participant. Data were collected during the assessment phase using JBSM, including observation, interview, physical examination, and review of medical records. The patient's behaviors were evaluated with Johnson's Behavioral Model Assessment Form. This structured instrument includes items for assessing the model's seven subsystems (SSs): Attachment/affiliative, Achievement, Aggressive/protective, Dependence, Sexual, Ingestive, and Eliminate. It is designed to determine the patient's behavioral status within each subsystem. The assessment form was developed by the researcher using reliable sources related to JBSM. Its face validity was reviewed and confirmed by three faculty members in nursing. The tool's reliability was evaluated through a test-retest method on two similar patients, yielding acceptable consistency. The assessment form is provided in Appendix 1 of the article.

The evaluation based on the JBSM was conducted in two stages: in the first, the patient's unstable behaviors within each subsystem were identified; in the second, the probable causes of these behaviors were analyzed. Each subsystem was assessed for both structure and function. To enhance the transferability of the findings, all research stages and activities were precisely documented, enabling other researchers to trace the research process and understand the characteristics of the studied case. The collected data and the results of nursing interventions were presented in tabular form.

The participant was assured that their information would remain confidential, and, in accordance with the principles of honesty and integrity, the identity of the case was not disclosed. Ethical principles were observed in accordance with the Helsinki Declaration, and an evaluation was conducted to assess the extent to which therapeutic goals were achieved.

2 Discussion

This study was a case report of an 88-year-old male patient with heart failure (HF) at Fatemeh Zahra Hospital in Sari. The patient's medical history included hypothyroidism, gout, rheumatoid arthritis, polycythemia vera, and chronic kidney failure, and he was receiving treatment with various medications. He had three sons and one daughter and routinely underwent hemodialysis twice a week. The patient also reported oral consumption of opium (approximately 1 g daily in two doses, morning and evening, dissolved in warm water) as self-medication without a physician's prescription.

He was 170 cm tall and weighed 72 kg, with a body mass index (BMI) of 24.9 kg/m². Over the past several months, he had developed severe dyspnea, profound fatigue, and marked lower limb edema. Medical evaluations revealed a left ventricular ejection fraction (LVEF) reduced to 30%, indicating moderate to severe systolic heart failure. Chest imaging also confirmed fluid accumulation in the lungs. Laboratory results are presented in [Table 1](#).

Table 1 Laboratory findings of the patient with heart failure

Laboratory test	Result	Reference/interpretation
Sodium	132 mEq/L	Mildly decreased
Potassium	4.8 mEq/L	Within normal range
Creatinine	2.3 mg/dL	Elevated, related to chronic kidney failure
Urea	65 mg/dL	Elevated
Hemoglobin	10.2 g/dL	Relative anemia
BNP	780 pg/mL	Elevated, indicating active heart failure

The treatment plan included lifestyle modifications, restriction of salt and fluid intake, dietary adjustments, and the prescription of new medications, such as diuretics, ACE inhibitors, and beta-blockers, to control fluid overload and improve cardiac function. The patient's home medication list is as follows ([Table 2](#)):

Table 2 Home medications of the patient with heart failure

Medication	Dosage and form	Frequency
Hydroxyurea	500 mg tablet	Daily
Nephrovit	Tablet	Daily
Febuxostat	Tablet	Daily
Aspirin	80 mg tablet	Daily
Metoral	50 mg tablet	Half tablet twice daily
Levothyroxine	0.1 mg tablet	Daily

The assessment of the behavioral subsystems is presented in [Table 3](#).

Based on the unstable behaviors identified in the previous stage, nursing diagnoses, goals, interventions, and evaluations were prioritized and are presented below:

1. The patient was diagnosed with an inability to perform daily household activities related to disease-related limitations. The goal was for the patient to perform daily activities, such as bathing, with the assistance of primary caregivers. Nursing interventions included encouraging the use of mobility aids. Upon evaluation, the patient bathed twice a week with assistance.
2. The patient was diagnosed with aggressive behavior related to experiencing acute phases of illness. The goal was that the patient would control anger and irritability during difficult periods. Nursing interventions included encouraging engagement in spiritual practices such as prayer, connecting with God, and performing meditation. Evaluation showed that the patient demonstrated self-control and did not exhibit aggression during acute illness episodes.
3. The patient was diagnosed with impaired mobility and walking ability due to physical illness and advanced age. The goal was that the patient would walk for 20 minutes daily with mobility aids. Nursing interventions included encouraging the use of a cane, adherence to physiotherapy sessions as prescribed by the physician, and maintaining shoulder-width foot positioning while walking. Evaluation revealed that the patient attended physiotherapy sessions regularly and walked at least 20 minutes daily with a cane.
4. The patient was diagnosed with constipation related to opium consumption and physical inactivity. The goal was for the patient to have bowel movements at least three times a week without straining. Nursing interventions included encouraging walking indoors with a cane, consuming laxative and fiber-rich foods, and drinking a glass of warm water each morning before breakfast. Evaluation indicated that the patient adhered to the recommended diet, walked indoors for 20 minutes daily, and reported at least three bowel movements per week without straining.
5. The patient was diagnosed with non-adherence to a uremic diet related to a lack of awareness about proper dietary management. The goal was that the patient would avoid foods high in potassium, low-biological value proteins, and excessive fluids, and would perform daily weight monitoring.^[15] Nursing interventions included providing education on avoiding foods rich in potassium, low-quality proteins, and excessive fluids. Evaluation showed that the patient followed the recommended dietary guidelines and performed daily weighing as instructed.
6. The patient was diagnosed with sexual dysfunction related to decreased sexual desire. The goal was partial fulfillment of sexual needs in accordance with physical weakness and underlying conditions.

Nursing interventions included arranging psychiatric counseling and encouraging verbal and nonverbal communication with the spouse. Evaluation revealed that the patient attended psychiatric consultations and reported satisfaction with spousal communication.

planning, and evaluating nursing care, particularly among children. This model helps experienced nurses gather comprehensive and reliable information about the patient's health status, thereby contributing to improved quality of nursing care.^[12] Furthermore, a study conducted

Table 3 Assessment of behavioral subsystems

Behavioral subsystems	Assessment	Stable behaviors	Unstable behaviors
Achievement	Entirely dependent on his children for daily household tasks.	—	Dependence and lack of independence in daily activities
Attachment/affiliative	Maintains good relationships with his children, especially his daughter; discusses problems with them and his wife.	Sense of belonging to his children and wife	—
Aggressive/protective	Becomes aggressive during disease exacerbations.	—	Lack of self-control in difficult situations
Dependence	Avoids walking due to advanced age and rheumatoid arthritis.	—	Inability to walk due to physical illness
Eliminative	Experiences constipation due to oral opium use. Urination is normal.	Normal urination	Improper bowel movement pattern
Ingestive	Does not adhere to a uremic diet.	—	Inadequate dietary compliance
Sexual	Reduced sexual desire.	—	Inadequate satisfaction of sexual needs

The results of the present study showed that the patient exhibited unstable behaviors in six behavioral subsystems, including Aggressive/Protective, Attachment/Affiliative, Dependence, Eliminative, Ingestive, and sexual, and sexual subsystems. Following the nursing interventions based on JBSM, these unstable behaviors were reduced or resolved across the subsystems.

Evaluations indicated that the patient was able to walk with a cane and successfully manage anger. He also achieved regular bowel movements three times per week, became aware of the principles of the uremic diet, and adhered to dietary recommendations. In addition, he spent more quality time with his spouse and consistently attended psychiatric counseling sessions. Given that nursing models can provide a scientific and structured framework for improving the quality of care for patients with heart failure, the findings of the present study are consistent with previous research. For instance, in a study conducted by Aghakhani et al., which aimed to investigate the effect of a self-care program based on Orem's model in patients with heart failure, it was found that the application of this nursing model significantly improved patients' quality of life and enabled them to adopt more effective self-care behaviors. These findings indicate that employing theoretical nursing models—such as JBSM or Orem's model—can play an essential role in enhancing both clinical and psychological outcomes and, consequently, improve the overall quality of care.^[15]

Similarly, a study conducted by Nooreddini et al. in Iran demonstrated that Johnson's behavioral theory is closely related to clinical performance and can serve as a framework for nursing practice in identifying problems,

by Rahmani et al. demonstrated that educational interventions based on JBSM led to a reduction in clinical symptoms of heart failure and an improvement in patients' quality of life. In that study, patients participated in educational programs that included information on dietary management and physical activity. The results indicated that the group receiving JBSM-based education experienced a significant decrease in dyspnea and lower limb edema.^[16] Similarly, research by Ghanbari Afra and Haji Mohammad Hosseini showed that the use of JBSM can facilitate better management of heart failure symptoms. Their findings emphasized that nurses, by identifying patients' unstable behaviors and designing appropriate interventions, could reduce symptoms and improve patients' quality of life.^[17] These studies are consistent with the findings of the present research and highlight the applicability of JBSM in the Iranian context. As Fawcett and DeSanto-Madeya stated, the application of JBSM is beneficial across various clinical settings and age groups and has been implemented in inpatient, outpatient, and community environments, as well as in nursing management.^[18] Since the present study is a case report, the scope of discussion is naturally limited. Moreover, as only one patient with heart failure was examined, the generalizability of the methods and strategies used is somewhat restricted. Therefore, it is recommended that future studies investigate the outcomes of nursing processes based on the JBSM using larger sample sizes and extended follow-up periods.

3 Conclusion

The findings of this study demonstrated that JBSM serves as an effective framework for providing nursing care to patients with heart failure. Using this model, nurses identified imbalances between the patient and the environment and designed appropriate interventions. The findings indicated that the patient experienced imbalances across several behavioral subsystems. Following the implementation of nursing care based on this model, the imbalance between the patient and the environment was reduced. This outcome reflects the positive impact of personalized nursing care on both the psychological and physical well-being of the patients. Therefore, it is recommended that the JBSM be considered a key tool in nursing education and practice, as it can contribute to improving the quality of care and promoting patient health. Furthermore, conducting additional studies on the application of this model in other clinical contexts could enrich the scientific literature and enhance therapeutic outcomes.

Clinical recommendations for nurses emphasized the importance of utilizing conceptual models such as JBSM, which assisted in more accurately identifying patients' behavioral needs. Regular assessment of behavioral subsystems was considered an integral part of daily nursing care, particularly for patients with chronic conditions such as heart failure.

Furthermore, designing nursing interventions based on behavioral imbalances enabled the provision of personalized care and enhanced its overall effectiveness. Training nurses in the practical application of behavioral models, especially in inpatient settings, improved the quality of care and contributed to better patient outcomes.

Declarations

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Artificial Intelligence Disclosure

The authors declare that this manuscript was prepared without the use of AI tools.

Authors' Contributions

All authors have contributed to the preparation of this study.

Availability of Data and Materials

The data analyzed in this study are available upon reasonable request.

Conflict of Interest

The authors declare that they have no conflict of interest.

Consent for Publication

Not applicable.

Ethical Considerations

This study was approved by the Research Ethics Committee of Mazandaran University of Medical Sciences under the Code of Ethics IR.MAZUMS.REC.1404.040. Written informed consent was obtained from the patient before participation. All ethical principles were observed in accordance with the Declaration of Helsinki, and participant confidentiality was strictly maintained.

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Appendix 1

Behavioral Subsystems Assessment Form Based on JBSM

This form was used as the assessment tool in the present study and was designed according to the structure of JBSM. The items were adapted from a reputable article: *Nursing Process Based on Johnson's Behavioral Model in a Patient With CVA: Case Report (Journal of Nursing Education, May–June 2021, Volume 10, Issue 2)*.

The form includes seven main behavioral subsystems of JBSM. For each subsystem, the patient's condition is documented through observation, interview, and medical record review. This raw form is provided in a reusable format for application in similar studies.

Behavioral subsystem	Description of patient's condition(based on observation, interview, and medical record)	Stable behaviors (if present)	Unstable behaviors (if present)
Achievement			
Attachment/affiliative			
Aggressive/protective			
Dependence			
Eliminative			
Ingestive			
Sexual			

This appendix was used as a standardized assessment tool in the study and is independent of the patient's clinical outcomes. Researchers can utilize this form in similar studies.