

Care of a Patient with Planned Left Ventricular Assist Device According to Michel's Theory of Uncertainty in Disease: Case Report

Sol Ventrikül Destek Cihazı Planlanan Hastanın Michel'in Hastalıkta Belirsizlik Kuramına Göre Bakımı: Olgu Sunumu

ABSTRACT

Heart failure (HF) is a significant chronic disease that impacts patients in multiple ways. Although heart transplantation is known as the only treatment for HF, due to the limited number of donors, many patients cannot receive transplants in sufficient numbers, leading to the application of alternative treatments. As a result, the use of left ventricular assist devices (LVADs), which represent the most current treatment approach, is increasing. Poorly understood treatments can cause patients to experience uncertainty. How healthcare professionals approach the patient during the care process is crucial. Nurses' use of theories and models during patient care enables them to deliver quality care. According to Merle Mishel's Uncertainty in Illness theory, the goal is to define the uncertainties perceived by patients, facilitate coping, and ensure compliance with the disease. This is the first case report addressing this treatment using the Uncertainty in Illness theory. It is believed that this approach will be valuable in evaluating patients' perceptions of uncertainty about the left ventricular assist device according to this theory.

Keywords: Heart failure, left ventricular assist device, nursing theory, uncertainty

ÖZET

Kalp yetersizliği (KY), hastaları birçok yönden etkileyen önemli bir kronik hastalıktır. Kalp yetersizliğinin tek tedavisi kalp nakli olarak bilinse de donör sayısındaki yetersizlik nedeniyle bu hastalara yeterli sayıda kalp nakli yapılamamakta dolayısıyla alternatif tedaviler uygulanmaktadır. Bu nedenle en güncel tedavi yaklaşımı olan sol ventrikül destek cihazlarının kullanılması giderek artmaktadır. Bilinirliği az olan tedaviler hastaların belirsizlik yaşamasına neden olabilir. Bakım sürecinde hastaya nasıl yaklaşılması gerektiği önemlidir. Hemşirelerin bakım sürecinde kuram ve modelleri kullanması hastalara nitelikli bir bakım verebilmelerini sağlamaktadır. Merle Michel'in Hastalıkta Belirsizlik kuramına göre amaç; hastaların algıladıkları belirsizlikleri tanımlayarak bu süreçle baş etmeyi kolaylaştırmak ve hastalığa uyumu sağlamaktır. Bu tedaviyi Hastalıkta Belirsizlik kuramı ile ele alan ilk olgu sunumudur. Hastanın sol ventrikül destek cihazı ile ilgili belirsizlik algısının, bu kurama göre değerlendirilmesinin yararlı olacağı düşünülmektedir.



Anahtar Kelimeler: Kalp yetersizliği, sol ventrikül destek cihazı, hemşirelik kuramı, belirsizlik

Introduction

Heart failure (HF) is a chronic, progressive, and common disease in which the heart cannot pump sufficient blood to the tissues, even at rest, resulting in unmet oxygen and metabolic needs.^{1,2} In patients with HF, symptoms such as dyspnea, fatigue, edema, cough, and activity limitation are characterized by structural and functional abnormalities.³ HF, one of the leading causes of mortality and morbidity worldwide, adversely affects quality of life due to poor prognosis, side effects of drug treatments, and recurrent hospitalizations.⁴

While the incidence of HF is approximately 1-2% in developed countries, it is known to increase with advancing age, reaching over 10% among those aged 70 and older. According to the Heart Failure Prevalence and Predictors (HAPPY) study by the Cardiological Society of Türkiye, the number of HF patients exceeds 2 million.⁵

CASE REPORT

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The primary treatment for HF is orthotopic heart transplantation, but due to organ shortages, alternative therapies are necessary. Consequently, left ventricular assist devices (LVADs) are increasingly being used as the sole treatment option for patients who are unsuitable for heart transplantation due to comorbidities or as a bridge therapy while awaiting a transplant. These devices alleviate HF symptoms, enhance functional capacity, and improve quality of life.⁶

HF causes uncertainty in patients due to its unpredictable prognosis and the challenges of the treatment process. This uncertainty acts as a stressor, leading to anxiety and negatively impacting patients' adherence to treatment. In a study examining the relationship between illness uncertainty and quality of life in patients with HF, perceived stress and acceptance were found to significantly influence the connection between illness uncertainty and mental quality of life.⁷ Another study identified the relationship between illness uncertainty, perceived personal burden, and quality of life in patients with chronic myeloid leukemia.⁸ Thus, how patients perceive and manage uncertainty plays a crucial role in their adaptation to the disease and the effectiveness of nursing interventions.^{9,10}

Uncertainty Theory in Diseases

“Uncertainty Theory in Diseases” was developed by Merle Mishel in 1988 to define and explain the uncertainty frequently experienced by patients. In 1990, it was revised for use in recurrent and relapsing chronic diseases.¹⁰

The theory aims to address the uncertainty experienced by individuals and their families during diagnosis and treatment. According to the theory, how patients perceive and manage uncertainty is crucial, as effective management increases adaptation to the disease.⁹ The theory focuses on three main concepts (Figure 1).

Pioneers of Uncertainty

Stimulus Frame: Refers to the form and structure of the stimuli perceived by the individual, influencing uncertainty before or during the illness.

Symptom Pattern: The degree to which symptoms occur with sufficient consistency to be perceived as having a form or structure.¹¹

Habitual Events: The degree to which a situation is repetitive or contains recognizable clues.

Similar Events: Consistency between expected and experienced events related to the disease.¹²

Cognitive Capacities: The individual's ability to perceive and evaluate uncertainty, reflecting both innate abilities and situational constraints.¹⁰

Structure Providers: Sources that directly or indirectly impact uncertainty, either positively or negatively.¹³ Three sources are mentioned:

Trusted Authority: The degree of trust individuals have in healthcare providers.¹⁴

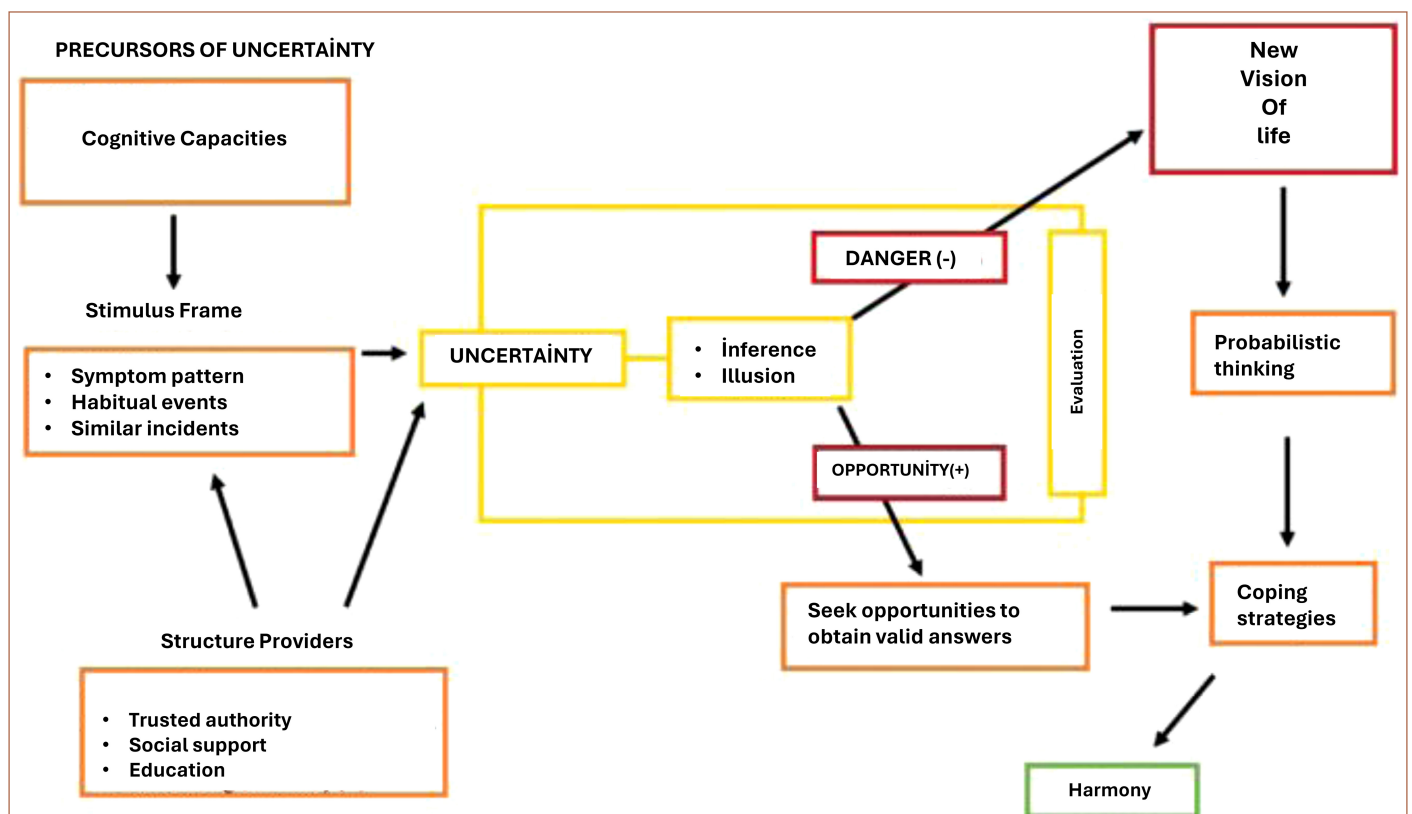


Figure 1. Uncertainty Theory of illness.

Social Support: The concept that helps individuals interpret the meaning of events, influencing their uncertainty.¹⁰

Education: Educated individuals can cope with uncertainty in a shorter time.⁹

2 Assessment of Uncertainty

Inference: The evaluation of uncertainty based on relevant remembered experiences.

Illusion: The formation of beliefs arising from uncertainty. Consequently, uncertainty appears as both danger and opportunity.¹²

Danger: A negative evaluation of the outcome of uncertainty.

Opportunity: A positive evaluation of the outcome of uncertainty.¹⁵

Coping with Uncertainty

Adaptation: The biopsychosocial behaviors of individuals in response to uncertainties that occur within their usual behavior range.

Coping: Effective strategic methods for achieving adaptation in response to opportunity and danger situations arising from the evaluation of uncertainties.¹²

New Life View: Acceptance of uncertainty as the natural rhythm of life, leading to the creation of a new sense of order by integrating continuous uncertainty into one's own structure.

Probabilistic Thinking: The belief that a constant expectation of certainty and predictability in life is unrealistic.¹⁵

Case Report

Clinical Evaluation of the Case

Identifying Features

The patient was 58-year-old married female with one son studying in the third year of university. Originally a Crimean Turk, she lived in Russia before her marriage and moved to Türkiye afterward.

Story

In May 2021, while she was with her son, who was studying at a university in Russia, she contracted COVID-19 and was hospitalized for two weeks. During that time, she experienced an inability to urinate, leg edema, and shortness of breath, initially thought to be kidney-related issues due to COVID-19. However, tests confirmed a diagnosis of HF. She reported feeling well for one week after discharge, but in the second week, her edema and shortness of breath worsened, resulting in another hospitalization. She was informed that she needed a heart transplant. Once she felt a bit better, she returned to Türkiye and sought treatment at a cardiology outpatient clinic. The tests there confirmed the diagnosis, and her treatment process began.

Curriculum Vitae and Family History

SHE, who has no known acute or chronic illnesses, mentioned that at the age of 20, she had a cyst in her right breast, which was removed under local anesthesia as an outpatient

procedure. She left the hospital the same day and did not experience any subsequent issues.

Regarding her family history, she stated that her father did not have any chronic illnesses, her mother had one heart attack, and two of her older sisters suffered from vascular occlusion in their extremities. She also noted that she smoked a small number of cigarettes for a short period but quit after contracting COVID-19 and has never consumed alcohol.

Physical Examination

She was referred from the cardiology department to the HF/heart transplantation department. On physical examination, the general condition was good, the patient was cooperative, oriented and had +2 edema in the lower extremities and her lips were slightly cyanotic. Peripheral pulses are palpable, extremities are warm and there is no numbness, capillary filling time is normal and skin color is normal. On cardiac examination, heart sounds are rhythmic and there is no additional sound. In vital signs, blood pressure: 104/72 mmHg, pulse rate: 89/min, electrocardiography in normal sinus rhythm, echocardiography with ejection fraction (EF) 30%, left ventricular diastolic diameter: 58 mm (37-53 mm), systolic diameter: 51 mm (22-38 mm). Height: 170 cm, weight: 85 kg, body mass index: 29.41 (overweight).

Laboratory Findings

Hb: 12.9g/dl, Hct: 41%, NT-Pro BNP: 235.1pg/ml, LDL: 129mg/dl, BUN: 23mg/dl, CRP: 13.47mg/dl, creatinine: 0.99mg/dl, ALT: 17U/L, AST: 18U/L, sodium: 135mmol/L, potassium: 5.5mmol/L, magnesium: 2.18mg/dl, TGFR: 55.48ml/min

Nursing Care According to Merle Mishel's Uncertainty in Illness Theory

In this case, nursing care was planned and implemented for a patient diagnosed with HF following COVID-19. The care addressed the definitive diagnosis, treatment type and process, examinations conducted to plan the treatment, and the uncertainties the patient experienced regarding the disease course. Nursing diagnoses were shaped according to the North American Nursing Diagnosis Association (NANDA)¹⁶ guide by identifying uncertainties and aligning them with physical findings.

The identified nursing diagnoses include: lack of information, impaired free decision-making, inadequacy in individual coping, impaired continuity of family processes, impaired comfort, impaired sleep patterns, activity intolerance, fatigue, weakness, and anxiety. The data collection process, according to the Uncertainty in Illness Theory, is detailed in Table 1. In this section, only a few of the diagnoses related to the Uncertainty in Illness Theory are discussed.

According to the Uncertainty in Illness Theory, diagnoses were made based on the Pioneers of Uncertainty data in Table 1.

Nursing Diagnosis: 'Lack of Knowledge' according to Stimulus Frame Data

Expected Outcome: Effective management of the patient's uncertainty and adherence to treatment.

Table 1. Data Collection Process According to the Components of Uncertainty Theory in Diseases

Pioneers of Uncertainty	
Stimulus Frame (Symptom Pattern)	As the patient was diagnosed with heart failure after Covid-19, it is thought that the perception of uncertainty increased due to reasons such as the poor and uncertain prognosis of this disease, the fact that the medical treatment method does not give definite results, the only treatment option is heart transplantation, demoralisation as a result of decreased functional capacity, fear of death, mortality rates observed in heart failure, and distance from his son.
Stimulus Frame (Habitual Events)	The increase in hospitalisations and emergency applications increases the uncertainty of the patient about his/her disease, and it is thought that some of the procedures and treatments performed in the hospital reduce the uncertainty due to the similarity that may be experienced in the following processes.
Stimulus Frame (Similar Events)	Since the patient had not experienced such an experience before, had not been hospitalised with a similar illness and had not seen a relative with a similar illness, he did not encounter a similar event.
Cognitive capacity	The patient stated that he had uncertainty about the course of his illness, that he had never been to a hospital, that he did not have a chronic illness and that he could not put such a big illness on himself. The patient sometimes shows his/her fear and anxiety by crying, thus it is seen that coping mechanisms are negatively affected.
Building Providers (Trusted Authority)	The patient stated that he liked and trusted the hospital and the transplant centre. He also stated that he trusted the transplant centre team and nurses.
Structure Providers (Social Support)	During the outpatient and inpatient follow-up, the patient had no other relatives other than his wife, and his son was studying in Russia. It was observed that she was upset because she could not go to him and support him.
Building Providers (Education)	The patient received education up to high school level in Russia. However, it was observed that they were not very distant from health-related concepts since the content of their education included health-related subjects.
Assessing Uncertainty	
Inference - Illusion (Danger-Opportunity)	During the right heart catheterisation, which was planned to investigate whether the patient was suitable for heart transplantation or left ventricular assist device, one of the coronary arteries was found to be occluded and a stent was inserted. Subsequently, right heart catheterisation was postponed. After the patient was discharged, it was expected that the symptoms of heart failure would regress, but there was no positive change. In this process, the patient started to ask questions about the next process, "What will happen, what will we do next?" and it was observed that he was uncertain about his treatment. In this process, he thought that he was losing time for his treatment and his uncertainty was interpreted as "danger", but since renal function tests and complete blood count values returned to normal with the medical treatment applied, his uncertainty in this process is interpreted as "opportunity".
Coping with Uncertainty	
Adaptation - Coping	During this process, the patient was told about the uncertainty of his prognosis until the transplantation order was received, and the patient was informed in detail about the left ventricular assist device and that it would be appropriate to implant a left ventricular assist device. The appropriateness of implantation of this device was proved by the examinations performed and a date was planned for the procedure. During this process, the patient did research himself and the questions he asked were answered in detail. At first, the patient was concerned about the device, "Do you wear this device all the time? How are the people who wear it afterwards, do they live? How will I use that device at home?" It was observed that the patient adapted to the process by smiling and saying "my only chance to live", "the surgery will be fine, I know", and his coping mechanisms became stronger as he gained information.
New view of life	It is understood that he now accepts the insertion of the device as a natural part of his life and that from now on he will organise himself with the device in his new life and will strive for this (in order to survive).
Probabilistic thinking	He recognised that the consequences of his illness were temporally unpredictable and therefore took advantage of the treatment option in front of him and turned it into an opportunity.

Interventions: The patient was encouraged to express perceived uncertainties and difficulties regarding her illness and treatment methods. Open, reliable, and effective communication was established to allow the patient to comfortably express her uncertainties. To empower the patient, understand her fears, clarify uncertainties, and provide direction, short and clear information about the disease, treatment, and side effects was provided using verbal and visual materials suited to the patient's education level. Support

from a patient education nurse and psychologist was obtained. While deciding on an LVAD, the patient was informed about the device through visual aids and was given the opportunity to meet other patients using the device.

Evaluation: The education and support provided for the lack of knowledge, combined with nursing interventions, led to the patient being more compliant and willing during treatment. The patient, who initially perceived uncertainty about her illness

and treatment as a danger, transformed it into an opportunity when she chose to receive an LVAD. Inference-Delusion, Compliance, and Coping are detailed in Table 1.

Nursing Diagnosis: ‘Anxiety’ according to Cognitive Capacity Data

Expected Outcome: The patient is able to cope with anxiety by addressing the uncertainties she experiences.

Interventions: A therapeutic relationship was established by encouraging the patient to express her feelings. Support was provided by staying with the patient during acute and distressing periods. Information about the procedures and treatment process were offered. Training was planned and delivered according to the spouse's informational needs at an appropriate time. Before discharge, the patient was educated on symptom management, self-care, nutrition, exercises, problem-solving skills, and relaxation techniques.

Assessment: The patient's anxiety was brought under control, and compliance with LVAD treatment was ensured. Table 1: Compliance - Coping, Probabilistic Thinking.

Nursing Diagnosis: ‘Inadequacy in Individual Coping’ according to Structure Provider Data

Expected Outcome: The patient is able to cope with and adapt effectively to the uncertainties experienced.

Interventions: Effective and active dialogue was established, allowing the patient to express her perception of death as a danger, her sense of dependency, and her inability to visit her son studying in Russia for a long time. The patient was assisted in analyzing her current situation to help overcome her inability to cope with the illness, and evaluated the effectiveness of her coping strategies. The patient lacked social support due to the advanced age of his spouse and the fact that his son was studying in Russia. This situation caused the patient to have a more negative view of his illness. The patient was encouraged to communicate frequently with his son over the internet. The patient was encouraged the patient to communicate frequently with her son via the internet.

Evaluation: A trusting relationship was established with the patient, and opportunities were structured with reliable authority. She expressed that she was encouraged to redefine her life priorities, gain a new perspective, and make sense of her illness. Table 1: Inference-Delusion, New Life View.

Discussion

In this case, SHE, who was receiving treatment for an HF diagnosis, was given nursing care according to Merle Mishel's Uncertainty in Illness Theory. This approach was necessary because she had to quickly decide whether to receive the LVAD planned for her treatment to prevent her disease from progressing and worsening, yet she was uncertain if this treatment would be right and beneficial for her.

According to the Uncertainty in Illness Theory, the nurse's role in providing education reduces uncertainty during the diagnosis and treatment process, thus alleviating associated anxiety. The theory initially emerged with cancer patients in

mind, so most studies have focused on this population. For instance, randomized controlled, qualitative, and descriptive studies like “Disease Uncertainty, Coping, and Quality of Life in Patients with Prostate Cancer”,¹⁷ “Spirituality in Disease Uncertainty: The Perspective of Oncology Patients”,¹⁸ and “The Effect of Coping Strategies on Uncertainty and Quality of Life of Korean Women with Gynecological Cancer”¹⁹ have all examined uncertainty in cancer patients. The findings from these studies show that the theory significantly impacts reducing disease uncertainty and improving coping strategies.

The theory was later applied to patients with chronic illnesses and their family caregivers, psychiatric patients, and COVID-19 cases.^{11,20-22} Its application in caring for COVID-19 patients demonstrated that it could be used for both acute and chronic diseases. In this case report, stress factors related to the left ventricular assist device and the patient's illness were identified to create supportive mechanisms in nursing care. The causes of uncertainty regarding the patient's symptoms, diagnosis, and treatment options were identified, and information was provided by nursing professionals. Additionally, SHE was empowered to manage uncertainty by communicating with other patients with left ventricular assist devices and sharing her experiences.

During this care process, the patient was encouraged to develop appropriate coping strategies. Her uncertainty, initially characterized as a danger, diminished, and an effective adaptation process was observed as she began to view her situation more as an opportunity. By the end of the care process, the patient had decided to receive a left ventricular assist device. Thus, it is clear that using the Uncertainty in Illness Theory is appropriate for the diagnosis and treatment planning of patients diagnosed with HF.

Conclusion

In conclusion, Merle Mishel's Uncertainty in Illness Theory is valuable both in developing coping mechanisms for the uncertainty and anxiety caused by a chronic disease such as HF and in turning uncertainty in treatment selection into an opportunity. It is recommended that this theory be used more widely in patient care. Qualitative or quantitative studies on the Uncertainty in Illness Theory could be conducted with these patients. Additionally, it is important to assess patients' perception of illness, social support resources, and anxiety using scales with proven validity and reliability. Furthermore, involving family members or caregivers in the educational process will also support this effort.

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