

Nursing care based on Dorothy Johnson's Behavioral System Model in Coronary Artery Disease: A case report

Selva Ezgi Aşkar^{1*}, Özlem Ovayolu²

¹ Mustafa Kemal University Hospital, Department of Education, Hatay, TR

² Gaziantep University, Faculty of Health Science, Department of Nursing, Gaziantep, TR

* Corresponding Author: Selva Ezgi Aşkar E-mail: selvaezgiaskar@gmail.com

ABSTRACT

Objective: The use of theory/model is very important in providing nursing care in standardized frameworks. One of these models in the literature is Dorothy Johnson's "Behavioural System Model".

Material and Methods: In this study, the nursing process of a 59-year-old patient who was followed up with the diagnosis of coronary artery disease and had many comorbid conditions but continued her negative behaviors towards her diseases was presented using Johnson's Behavioural System Model.

Case: In our case, first of all, a detailed medical history was taken and physical examination was performed, and conditions that disrupted the balance of the subsystems in the model were determined. Afterwards, a nursing care plan that can be implemented to provide behavioural change to restore balance was designed.

Conclusion: Since it is very important to provide behavior change in chronic diseases, it is recommended to use Johnson's Behavioural System Model in chronic disease management and to conduct studies in different chronic diseases.

Keywords: Behavioural system model, care plan, coronary artery disease, nursing

INTRODUCTION

The use of care plans prepared in line with the nursing process is very important in order to deal with the individual in a holistic and systematic way and to provide a standard nursing care [1]. Nurses have put forward some theories to show the relationship between this professional care given in line with the plan and the results obtained. These theories establish relationships between concepts. Models are defined as symbolic or physical ideas that are used to easily explain the relationship between concepts as well as thoughts. Accordingly, it is crucial to use theory/model in making nursing practices in a standard framework and eliminating deficiencies [2-4]. Implementing the nursing care process based on theory/models helps collect and analyze data and provide holistic care [3].

Nursing models such as Neuman Systems Model, Roy Adaptation Model, Orem's Self-Care Deficit Theory, Peplau's Theory of Interpersonal Relations, Pender's Health Promotion Model, Dorothy Johnson's Behavioural System Model have been used in case reports investigating the clinical use of nursing models in the literature [3]. Therefore, this study aims to provide the behavioural system model-based nursing care of a case diagnosed with coronary artery disease (CAD) and to contribute to the literature.

Dorothy Johnson's Behavioural System Model

The Behavioural System Model was first defined by Dorothy Johnson in 1980 and is based on behavioural sciences such as psychology, sociology and ethnology [4]. According to Johnson, the nurse helps the individual to facilitate behavioural functions before, during and after the illness. Nursing, on the other hand, is a professional discipline focusing on keeping the individual in balance and re-establishing the balance in case of imbalance [4,5]. Nursing interventions include protecting, supporting, and stimulating subsystems and ultimately regulating the entire system [6]. Moreover, another component of the model, the individual, is defined as the behavioural system. The behavioural system includes subsystems that affect each other and are interdependent.

Case Report Article

Received 16-01-2022

Accepted 14-02-2022

Available Online: 23-02-2022

Published 28-02-2022

Distributed under
Creative Commons CC-BY-NC 4.0

OPEN ACCESS



Each subsystem interacts with the environment. Disruption of any subsystem leads to the impairment of balance, thus in turn resulting in impairment of health. The nurse, on the other hand, supports the individual's attempts to maintain the balance with the Behavioural System Model with his/her roles such as education and intervention [4,6]. Johnson's Behavioural System Model consists of seven subsystems [4,6-8]:

- Affiliative subsystem; it is the basis of social events. People have warmer relationships with others.
- Dependence subsystem; people pay attention to and feel trust towards others without any expectation with the aim of getting help.
- Ingestive subsystem; it is the maintenance of the integrity of the organism by meeting the needs of the individual such as food and oxygen.
- Eliminative subsystem; it is the excretion of biological waste from the organism
- Sexual subsystem; it is development of sexual identity and supporting sexual satisfaction.
- Achievement subsystem; individuals motivate themselves and their circle in order to meet the needs and achieve the goal.
- Aggressive subsystem; individuals make attempts to defend themselves and their circle in order to preserve and maintain integrity.

Each subsystem consists of four structural elements. These elements are drive, set, choice, and action [8,9]. Furthermore, in the model, Johnson classifies nursing diagnoses as various "insufficiency, discrepancy, incompatibility, and dominance" based on the individual's problems with these diagnoses. Depending on the situation, the nurse applies interventions that are not easily observed but can be deduced. As a result, the nursing intervention is evaluated by directly observing the individual's behavior or performance. [9].

Profile of the Case with Coronary Artery Disease

A 59-year-old female patient is unemployed. She is married and has three children. She lives at home with her husband and a single son.

The patient applied to the cardiology outpatient clinic due to the complaint of chest pain. After the evaluation, it was planned to admit her to the service. She stayed at the hospital several times before and she underwent coronary angiography four times. She underwent her last coronary angiography in March 2021. Coronary angiography was planned for her during this hospitalization, as well. When she learned that she was going to undergo angiography again, she started to cry and said, "Why couldn't I recover? Yow... same again, they will do an angiogram operation for me again.". She

has a medical history of CAD, diabetes, hypertension, and heart failure. She stated that she did not monitor her blood glucose regularly and did not check blood pressure because she felt well at home. She also has the diagnosis of breast cancer in her medical history and underwent a left mastectomy in 2017. She is not a smoker but said that she was accompanying her husband with 1-2 cigarettes while they are drinking a cup of coffee. She does not consume alcohol.

She stated that she was living at home with her husband and one child and they ate the same meal because she could not cook separately for everyone, therefore she did not follow any dietary program for her diseases, she was generally eating two meals and did not eat snacks, she was paying attention to take her drugs but she rarely forgot to take them. Her drugs were Acetylsalicylic acid 100 mg 1x1 tb, Metoprolol succinate 50 mg 1x1 tb, Ramipril/ hydrochlorothiazide 10/25 mg 1x1 tb, Amlodipine 10 mg 1x1 tb, Clopidogrel 75 mg 1x1 tb, Pantoprazole 40 mg 1x1 tb, Atorvastatin (Ator) 40 mg 1x1 tb, Atorvastatin (Colastin-L) 20 mg 1x1 tb, Letrozole 2.5 mg 1x1 tb, Pioglitazone HCl 45 mg 1x1 tb, and Empagliflozin 25 mg 1x1 tb.

She stated that she is doing her housework - albeit taking breaks periodically. She claimed that she is exhausted and (yet) looks after herself. She added that her works never end because her husband is constantly inviting guests over and doesn't help her out. Moreover, she told us that her married son always accompanies her to the hospital. She feels as though she is a burden on him, and that she has kept him away from his family. This, in turn, has upset her and caused her stress.

The patient stated that she had no problem about urination, but she did not defecate for two days since the hospital influenced her. She stated that she could not sleep at night, woke up for no reason, and often could not fall asleep for more than 30 minutes. She said that she prayed for having a comfortable sleep, had concerns about the future, felt uneasy, and sometimes very sad, and she wanted to regain her health. Her mother suffers from hypertension and heart disease and her father has diabetes, she lost her brother due to myocardial infarction and her sister due to bowel cancer, all of which underlies her fears and concerns.

The physical examination of the patient was performed by the first author and physician. In the inspection and palpation performed by the first author, it was observed that there was no edema in the body, no obvious complaint about lymphedema, and no other finding other than dryness and thickening in the skin of the feet. She suffered from tingling, burning sense, and sometimes stinging pain in her feet. Peripheral arterial pulses were taken in bilateral lower and upper extremities. The auscultation findings made by the physician were accessed from the patient file. During

auscultation, it is recorded that respiratory sounds were normal and S1 and S2 heart sounds were heard. No additional sound or murmur was heard. Her other system examinations were assessed as normal. Among her vital signs, body temperature: 36.7°C, blood pressure: 143/79 mmHg, pulse: 73/min, respiration: 24/min, and oxygen saturation: 96%. Her laboratory findings were glucose: 191 mg/dl and HbA1C: 8.2% (high) and cholesterol levels and other laboratory findings were normal. Electrocardiography findings were at the sinus rhythm and echocardiography findings decreased with 35-40% ejection fraction (EF) and first-degree tricuspid insufficiency (TI), dilated left atrium (LA), and left ventricular hypertrophy (LVH) were noted.

The patient underwent coronary angiography as planned. Left Anterior Descending (LAD) was proximal stenosis at the rate of 70%, Circumflex (Cx) had plaque and Right Coronary Artery (RCA) was open. The patient was suggested to receive stent for LAD and medical treatment for CAD and discharge was planned.

Nursing Care of the Case According to the Behavioural System Model

The nursing process planned according to Johnson's Behavioural System Model for the patient who was diagnosed with CAD, underwent coronary angiography several times and had a comorbid condition is shown in the **table 1**.

Table 1. The nursing process planned according to Johnson's Behavioural System Model

Subsystem	Function	Diagnosis	Planning and Application
Affiliative	<ul style="list-style-type: none"> - Living at home with her husband and son. - Her married son does not spend time with his wife and children since he accompanies her. Her daughter-in-law did not call her throughout her last hospitalization and all of this makes her upset. - Not going outside too much, getting tired due to her diseases. - Having fear since she suffers from diseases in her family history, thinking that her own outcome would also be bad like theirs and stating that she have many sleepless nights without any reason 	<ul style="list-style-type: none"> - Insufficiency/Dominance 	<ul style="list-style-type: none"> - An environment with her husband and son is created and the importance of family support and assistance is emphasized. - She is encouraged to talk to her daughter-in-law and supported in solving the problem. - It is recommended for her to make non-tiring activities and take a slow walk in the fresh air. - She is allowed to express concerns and fears. Lifestyle changes are planned to control the disease. - Non-pharmacological (breathing techniques, relaxation, etc.) methods are taught her to eliminate sleep problems. - She is allowed to express her thoughts about death.
Dependence	<ul style="list-style-type: none"> - Providing self-care. - Suffering from dyspnea while dealing with household chores. 	<ul style="list-style-type: none"> - Insufficiency/Dominance 	<ul style="list-style-type: none"> - She is provided support for household chores. - She is trained to take breaks frequently and control breathing (breathing deeply and slowly) to conserve energy and reduce dyspnea while doing household chores.
Aggressive	<ul style="list-style-type: none"> - Being unable to usually finish household chores and getting tired of guests her husband always invites at home. - Stating that her husband was constantly smoking next to her even though she herself did smoke and that she was smoking one or two cigarettes with her coffee just to accompany him. 	<ul style="list-style-type: none"> - Insufficiency/Dominance 	<ul style="list-style-type: none"> - She is encouraged to talk to her husband about the situations she feels uncomfortable. - A meeting with her husband is planned. He is informed about the necessity of meeting her care needs and its importance. - The relationship of smoking with chronic diseases is explained. The harms of passive smoking are indicated. Not smoking and the effects of smoking next to her are explained. If necessary, professional support is provided in this regard.
Ingestive	<ul style="list-style-type: none"> - Eating without any help. - Not following a specific diet for diabetes and hypertension. - Having never seen a diabetes nurse and a dietitian even though she had a history of diabetes for nine years. - Eating two meals a day and having irregular eating habits without taking any snacks. - Not knowing how to eat and not applying it. 	<ul style="list-style-type: none"> - Insufficiency/Dominance - Discrepancy/incompatibility 	<ul style="list-style-type: none"> - A meeting with the diabetes nurse is scheduled. - If necessary, a dietitian support is provided to regulate her nutrition. - The importance of monitoring blood glucose and blood pressure is emphasized. - It is questioned whether she has a personal glucometer and blood pressure monitor. If she does not have it, she will be helped to buy them. - Hypoglycemia and hyperglycemia are defined. She is informed about their symptoms. She is enabled to take measures. - She is informed about the relationship of nutrition with chronic diseases. - The importance of foot care is explained to her. - By providing an environment where family members living at home are present, it is planned to serve the meals that will be suitable for her, as well.

Eliminative	<ul style="list-style-type: none"> - No problem in urinating. - Being unable to defecate for two days. - Stating that the hospital environment affected her and she had related problems. 	- Insufficiency/ Dominance	<ul style="list-style-type: none"> - Defecation is followed up. Bowel movements of the patient are checked. - She is enabled to eat fibrous foods.
Sexual	<ul style="list-style-type: none"> - Being married and having three children, undergoing left mastectomy and going through menopause. 	- it was not assessed.	- It was not assessed.
Achievement	<ul style="list-style-type: none"> - Having difficulty in doing household chores. - Being unable to check blood glucose and blood pressure. - Keeping follow-up of her drugs and taking them herself. - Expressing that she could not realize her own in the hospital and thinking that she was imposing a burden to her married son. - Inability to sleep well due to worries and fears. - Saying that she still has clogged vessels in her coronary angiography. - Thinking that she cannot take her disease under control and cannot recover despite taking her drugs regularly. 	- Insufficiency/ Dominance	<ul style="list-style-type: none"> - She is enabled to take support for household chores. - She is informed about the importance of monitoring blood glucose and blood pressure. Her knowledge on this subject is questioned and her lack of knowledge is met. - Since she provides self-care, this is maintained. Her positive behaviors are supported. - The stress associated with the concerns and fear she feels and the negative relationship of stress with her diseases are explained to her. - Stress-related coping methods are taught to her. - She is encouraged to freely express her thoughts about the future. Her concerns are eliminated.

CONCLUSION

In this study, the nursing process of a patient who was diagnosed with CAD, underwent coronary angiography several times and had a comorbid condition but continued her negative behaviors towards her diseases, was presented using Johnson's Behavioural System Model. As is known, the Behavioural System Model provides a conceptual framework in nursing practices [4]. It also reveals the situations requiring the nurse's attention during her care. The main task of the nurse is to help the individual to change his/her behavior [7]. In the present case, the medical history of her, which we considered as the behavioural system, was taken in detail, her physical examination was carried out and then conditions disrupting the balance of subsystems were detected. Afterwards, a nursing care plan, which can be implemented by the nurse, a component of the external environment, was designed to provide behavioural change to bring into balance again. There are a limited number of studies in Turkey using the Behavioural System Model. However, studies also show that the model is useful in planning an effective nursing care [6,7,10,11]. The international literature has revealed that the model has a positive effect on nursing outcomes in different studies based on the Behavioural System Model in their theoretical frameworks [5,9,12,13]. It is very important to provide behavioural change in chronic diseases. In this sense, it is suggested to use Johnson's Behavioural System Model in management of chronic diseases and to conduct studies on different chronic diseases, as well.

Author Contributions: **SEA:** wrote the manuscript and obtained the patient consent. **ÖO:** critically reviewed and edited the report. All authors read and approved the final manuscript.

Conflict of interest: The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. This research did not receive and a specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval: The study was conducted according to the guidelines of the Declaration of Helsinki and approved by Local Ethical Committee.

REFERENCES

1. Kocaçal E, Aktan GG, Eşer E. Development of nursing process and care plans in historical process. *Anatolian Journal of Nursing and Health Sciences*. 2021;24(2):284-290.
2. Koç Z, Kızıltepe KS, Çınarlı T, Sener A. The use of theory in nursing practice, research, management and education. *Koç University Journal of Education and Research in Nursing*. 2017;14(1):62-72.
3. Şahin G, Buldak Cİ, Kaya V, Güvenç G, İyigün E. The examination of the graduate studies performed by using the theory and model in the nursing field at turkey: A systematic review. *Koç University Journal of Education and Research in Nursing*. 2020;17(2):170-9.
4. Velioglu P. Concepts and theories in nursing. Istanbul: Academy Press; 2012.
5. Tynan A. Supporting positive lifestyle changes among patients with diabetes mellitus type 2. *Nursing Senior Theses* 4. 2020.
6. Evgin D, Özdil K. A theoretical approach to encouraging fathers to support breastfeeding: Johnson's behavioural system model. 6th International Congress on Women and Children's Health and Education Proceedings Book. 2020;75-83.
7. Kardaş Kin Ö, Türezen A. interpretation Dorothy Johnson's behavioural system model: COPD case report. *Journal of Nursing Science*. 2018;1(3):46-50.
8. Pektekin Ç. Nursing philosophy. Istanbul: Istanbul Medical publications 2013.
9. Karkhah S, Ghazanfari MJ, Norouzi M, Taheri Z. Designing a nursing care plan based on Johnson's Behavioural Model in patients with wrist joint hematoma: A case study. *Research Square*. 2020.

10. Erkoç A, Yürügen B. Dorothy E. Johnson's Behavioural Systems Model: Case report. 14th National Internal Medicine Congress Proceedings Book. 2012;395-396.
11. Evgin D, Bayat M. The effect of Behavioural System Model based nursing intervention on adolescent bullying. *Florence Nightingale Journal of Nursing*. 2020;28(1):71-82.
12. McGuinness M. Utilizing the Behavioural System Model for adolescent depression in the school setting. 2021.
13. Runner TR, Berryman JJ, Lehrer JC. Utility of the beck depression inventory in patients with chronic kidney disease stage 4 without kidney replacement therapy. *Nephrology Nursing Journal: Journal of the American Nephrology Nurses' Association*. 2021;48(2):147-167.