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Case Report

Roy Adaptation Model for Patients With Hypertension: A Case Report

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ABSTRACT

Background and Aim: Hypertension is a significant risk factor for cardiovascular disease and is the leading cause of death worldwide. The nursing process based on the Roy adaptation model is widely used to solve the problems caused by chronic diseases. This study aimed to adapt the model performed on patients with hypertension.

Materials and Methods: The study was conducted in the autumn of 2021 in one of the hospitals of Qom University of Medical Sciences, Qom City, Iran. A patient with hypertension was examined, and a Roy model was performed on him. Nursing care was performed based on the Roy nursing process in 6 stages.

Results: The study showed that the patient had maladaptive behaviors in four modes (physiological needs, adaptation of self-concept, role function, and independence and dependence). After nursing care based on the Roy adaptation model, maladaptive behaviors decreased.

Conclusion: According to the present study results, nursing care based on the Roy model can affect the physical, psychological, and maladaptive behaviors of patients with hypertension. In this regard, Nurses can play a more effective role in improving the maladaptive behaviors of these patients by applying nursing care based on the adaptation model.

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1. Introduction

Hypertension is one of the major public health problems worldwide and has an important role in various diseases. About 423 million cardiovascular diseases were reported, and 17.9 million deaths were associated with cardiovascular diseases worldwide in 2015 [1]. Hypertension is the 3rd risk factor attributed to disease burden worldwide among the six main factors [2]. In developed countries, the prevalence of hypertension has remained unchanged or decreased, while it has increased in developing countries [3]. Globally, about 25% of adults had hypertension in 2000, and this rate is expected to increase to 29% by 2025 [4]. The prevalence of hypertension in high-income countries has also shown an increasing trend compared to low- and middle-income countries [3]. Hypertension can lead to chronic health problems and increase the risk of stroke, kidney diseases, cardiovascular diseases and subsequent deaths [5]. The disability resulting from these diseases and the physical changes that occur due to high blood pressure can affect the mental image and behavior of patients [1]. Nurses have an important role in educating and supporting patients with chronic diseases in care strategies. Social communication with other patients and professional support enables patients to adapt to chronic diseases. Social support and good mental status affect patients' physiological and functional status and better social activities and physical health. The care goals in heart failure are to promote continuity of care, reduce symptoms, hospital stay, and frequent hospitalization. If the patients understand the care programs adequately and appropriately, they will gain their independence, which improves the individual situation and reduces the need for nursing and improves the condition of patients. Nurses must take the most appropriate education about chronic diseases, problems, treatment, side effects, and activities that a patient can do to support patients while providing compatibility with the disease [6]. Therefore, achieving health is possible by establishing adaptation in various human dimensions. Roy adaptation model is one of the practical and effective models in nursing that have paid particular attention to this issue [7]. According to this model, the nurse examines the individual primarily and accurately. Then, the maladaptive behavior is interpreted in four dimensions: physiological needs, self-concept, interdependence, and role function, along with the stimuli of each behavior. Next, educational and care program is designed to address the individual's problems [8]. According to the Roy adaptation model, man is a biological, psychological, social, and spiritual being associated with his or her surroundings and uses adaptation mechanisms to communicate and maintain balance. Roy defines adaptation as how a person responds to environmental stressors or stimuli. Roy considers the degree of adaptation as the sum of the effects of the three focal, contextual and residual stimuli that manipulation of these stimuli during the care program increases adaptation and, therefore, better control of the disease [9]. Various studies show the use of this disease in different patients. In a review study, Mehdi Pour (2021) stated that the Roy adaptation model improves patients' health and quality of life with heart failure [6]. In an intervention study, Mastaelizadeh (2018) introduced the Roy adaptation model effective in diabetes patients [10]. In the case report study, Ghanbari-Afra (2020) reported the positive effect of the Roy adaptation model on correcting maladaptive behaviors of patients with COVID-19 [11]. In general, disease control will be affected by a complex network of behavioral, attitudinal, and healthcare factors that collectively challenge patients' psychological and social adaptation. Disruption of patient adaptation can cause problems such as insomnia, restlessness, irritability, nervousness, fatigue, anxiety, attention deficit, lack of control over emotions, and isolation [12]. The conceptual models of nursing in nursing care can be a framework to connect critical thinking in terms of clients, better analysis conditions organized thinking to make the best decision for the patient, problem-solving, increased presence in clinical practice, and increased patient participation in treatment. Conceptual nursing models provide unique knowledge that can guide case studies and increase educational content application in nursing practice [13]. One of the approaches that allow nurses to implement nursing models is case studies because nurses in case studies use creative thinking and problem-solving to provide a care program based on the needs of the patient and his family. Based on the Roy adaptation model, nursing care has been extensively evaluated in chronic diseases such as multiple sclerosis, heart patients, and diabetics [12, 14-16]. However, no study was found on the emerging and acute disease of COVID-19. While these patients, due to their chronic and debilitating nature, need a comprehensive nursing care program. Therefore, the researchers decided to conduct a study to evaluate the Roy adaptation model in a patient with hypertension. Maybe a step can be taken toward the health of the community.

2. Case Presentation

A descriptive case study (case report) was performed in the fall of 2021 in one of the hospitals of Qom University of Medical Sciences. A hypertensive patient diagnosed with diagnostic tests with the approval of an infectious specialist was selected. He had no psychiatric diseases or cancer, and the Roy model was implemented in him. The researcher 1st came to the patient's bedside to observe safety protocols for conducting the study. The purpose of the study and how it was performed was fully explained to the patient. Written consent was taken from the patient. The researcher was present at the patient's bedside daily, performing the patient's status change and nursing process. Based on the Roy nursing process, nursing care was performed in 6 stages: behavior assessment, stimulus assessment, nursing diagnosis, goal setting, intervention, and evaluation. In this route, three face-to-face interviews were conducted with the patient. Also, after discharge by telephone, the patient's condition was followed up.

Our patient was a 66-year-old man, married with three children, and worked with a bachelor's degree in Qom. His income was average, with social security coverage. The data for autumn 2021 was the source of the patient's information. In November 2021, he suffered from dizziness, headache, lethargy, feeling of heaviness in the chest, and nausea. He was diagnosed with a hypertensive crisis and was admitted to a hospital at Qom University of Medical Sciences. His blood pressure was 220/105 mm Hg, heart rate 85 per minute, temperature 36.9°C, respiratory rate 19 per minute, and arterial blood O_2 saturation was 96%. Drug treatment (nitroglycerin, oxygen therapy, and Lasix) was started. He reported a history of previous high blood pressure.

3. Implementing Roy Model

The patient nursing care was done based on Roy's adaptation. This model has 4 modes. The 1st mode is a physiological needs mode, to check activity, sleep, nutrition, defecation, blood circulation and oxygenation of tissues, senses, fluids and electrolytes, neurological function, regulatory mechanisms (endocrine), and three stimuli: focal, contextual, and residual.

Activity

The patient's muscular body and joints were normal in their range of motion. On examination, the patient had no movement limitation, tenderness, redness, and swelling. Ankle, fingers, and nails were normal. There was no clubbing and hyperkeratosis. Due to weakness and lethargy, the patient needed support while walking his armpits. Due to severe weakness, he could not do his work alone.

Sleep and rest

He was hard to sleep, and because of the constant headache, he had interrupted sleep and woke up four times during the night.

Nutrition

The patient refused to eat due to nausea in the 1st hour of edema. After controlling the pain, the patient regularly consumed and tolerated meals. Mucous membranes were normal. He did not have periodontitis. The appearance of the abdomen was normal. It lacked rigidity, guarding, or tenderness. Hearing bowel sounds and bowel movements were normal. The patient weighed 73 kg and had no weight loss. He was aware of diet and adherence to it.

Defecation

No signs of urinary tract infection, history of gynecological problems, genital ulcers, and discharge were seen.

The patient had daily defecation, and the stool consistency was loose and brown.

The urine analysis and culture, and fecal examination were normal.

He had natural defecation with fiber intake.

Blood circulation and oxygen status of tissues

Respirations were spontaneous, and the chip was in the midline. He was short of breath. The client's breathing was symmetrical. The patient received O_2 2-3 L/min with an oxygen catheter mask. He was in a semi-sitting position. There was no chest deformity. A wheezing respiratory sound was heard throughout both lungs. There was no murmur. Cardiac sounds were normal and physiological. Capillary return and dilatation of the jugular vein were normal. In cardiac monitoring, regular heart rhythm was sinus. Sometimes premature ventricular contraction (PVC) was seen. On the 2nd day, the sinus rhythm was without dysrhythmia. The pulse of the upper and lower extremities was normal. The patient did not have clubbing or cyanotic. The patient did not take tobacco.

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His blood pressure was 220/120 mm Hg on admission, which improved with medication and was checked every 15 minutes. His respiratory rate was 19 per minute, pulse rate was 85 per minute, the temperature was 36.9°C, and O_2SAT=96%.

Senses

The patient had chest pain that was reduced by nitroglycerin infusion. Headache also improved by lowering the patient's hypertension and taking acetaminophen. The conjunctiva was slightly pale. The sclera was not icterus. The external structure of the patient's eyes, ears, and nose and sense of sight, taste, smell, and hearing are normal. The patient's pain score was 5 out of 10.

Fluids and electrolytes

Skin turgor was normal. There were no signs of acidosis or alkalosis. In the measurement, serum electrolytes were in the normal range. Venous blood gas (VBG) and electrolytes were in the normal range.

Nervous function

The patient is conscious and oriented. He was concerned about the condition of the disease and the state of recovery. The patient's thinking and memory are healthy. His Glasgow Coma Scale (GCS) was 15.

Regulatory mechanisms (endocrine glands)

No thyromegaly or lymphadenopathy was detected. The focal stimuli were high blood pressure and patient pain. Despite resting, taking medication, and observing the necessary items, the patient still had respiratory distress and fear of transmission to others and could not perform many activities independently. Contextual stimuli included inadequate sleep due to environmental stimuli, feelings of loneliness after being away from family, and gastrointestinal symptoms following medication (three-drug regimen), according to the patient. The residual stimuli included the patient's concern about the disease and the recovery process.

Physiological needs of the patient

In physiological needs mode, the following nursing diagnoses were made for the patient:

Pain or discomfort in relation to disease,

Inadequate and ineffective breathing model associated with the current disease,

Impairment of physical activity associated with disease, and Sleep disorder is associated with disease concerns and environmental stimuli in an unfamiliar environment.

Nursing goals

The nursing goals were set in the following order:

Reducing the pain of the patient,

The patient maintains an effective respiratory model,

The patient has the maximum activity due to the limitations,

The patient performs his care activities according to the limitations, and the patient is satisfied with his sleep.

Nursing interventions of "feeling pain and discomfort related to the disease" were performed as follows. Relaxing measures (such as massage and posture change) were performed. Fun or distracting activities such as watching TV or listening to the radio or favorite music, interacting with others, and using nitroglycerin and painkillers were used. After one hour, the patient had no chest pain, giving a 0 out of 10 to chest pain. The headache was relieved in the special ward within 6 hours. The results of the measures in this diagnosis were obtained in a short time.

Interventions related to nursing diagnosis, "a model of inappropriate and ineffective respiratory associated with the current disease," were conducted as follows. He received 2-3 L/min of oxygen intermittently through an oxygen catheter mask during the 1st day. The patient was placed in a semi-sitting position. Breathing training was provided in deep breathing every two hours and breathing slowly during shortness of breath. The training was then monitored. If necessary, the training was repeated. When a patient's hypertension is higher than 170 mm Hg, it causes shortness of breath. The patient did not have shortness of breath on the 2nd day. The improvement in the patient's respiratory status was significant.

Interventions in relation to nursing diagnosis, "impairment of physical activity associated with disease," were conducted as follows. On the 1st day, the patient was not allowed to leave the bed and was confined to bed. On the 2nd day, he got out of bed by controlling his hypertension and the support of a nurse and a wheelchair. On the 3rd day, the patient was out of bed independently to do the essentials. On the 4th day, the patient was transferred to the ward. In this nursing diagnosis, the patient succeeded in recovering activities in the medium term.

Interventions for the nursing diagnosis, "sleep disorder associated with disease concerns, and environmental stimuli in an unfamiliar environment," were conducted as follows. Before going to sleep, the patient's basic needs were met, such as thirst, hunger, and defecation. The patient's fear and anxiety were reduced by giving positive energy about recovery before bed. Sounds and additional activities were minimized, and before 10 PM, all the drugs and therapeutic procedures were performed. Environmental stimuli such as excess light are minimized. Techniques such as guided imagery relaxation before bedtime were used, and the patient's calm and favorite music, with the patient's hands-free, was played for 20-30 minutes. Caffeinated beverages were avoided after 7 PM every night. On the 1st and 2nd nights, the patient's sleep was interrupted, but following the steps taken, sleep in the short term improved.

The 2nd mode is the mode of self-concept adaptation and includes the physical self (mental image of the body), the personal self (self-consistency, self-ideal, spiritual self, ethical-spiritual self), and the interpersonal self (understanding that the self in relation to others, finds). In the realm of the physical self, the patient has a neat appearance with the help of others. He was satisfied with his weight and appearance. The mental image of oneself is good. He felt weak, helpless, and tired of being confined to bed. He does not feel as strong as before and does not feel good about himself. In the realm of the personal self, the patient is a Shiite Muslim and considers God as the source of his power, hope, and excellence and believes that man can overcome all problems (ethical-spiritual self) by relying on God. The patient performs his religious duties in the hospital. The patient was worried about his wife and child. He likes to get well as soon as possible, return home, and be stronger. Deals calmly in situations (ideal self). In the realm of interpersonal self, the patient prays and cries away from others in times of distress and anger. He has moved away from others due to hospitalization in the special ward. Occasionally he talks to his child and family on the phone. The patient looks very desperate and sad; he says that he thinks about the disease process and his recovery. He is worried about the future of his family and work life. He is afraid of possible death.

In the mode of self-concept adaptation, the following nursing diagnoses were made for the patient:

Fear and anxiety related to medical diagnosis, and Psychological distress related to the threat to family and work life by the disease.

Accordingly, the nursing goals were determined in the following order:

Reducing the patient's fear and anxiety about the medical diagnosis. Shedding fewer tears. Calmness can be seen on the face. The body movements become calm.

Reducing psychological distress by expressing positive feelings about himself and the value and meaning of life.

Necessary interventions in the nursing diagnosis of "fear and anxiety related to medical diagnosis" were performed as follows. On the 1st day of hospitalization, he was given hope and motivation by providing realistic information about the disease process, symptoms, treatment, and prognosis. The nurse stood 1.5 meter in front of the patient and leaned toward him. She made eye contact with him, and actively listened to him, especially when he started crying. He was given ample opportunity to express his feelings. The patient was asked to recount one of his most difficult experiences in the past. He described his son's accident experience. He asked how to deal with it. He used coping strategies such as talking about the problem and consulting a psychologist. The nurse in the current situation taught strategies to prevent hypertension. He suggested stretching exercises in bed in a hospital setting and planning post-discharge exercises such as yoga therapy and aerobic exercise at home. After establishing the nurse's relationship with the patient, the patient's fear and anxiety decreased quickly. She shed fewer tears and seemed calmer.

Interventions related to the nursing diagnosis of " psychological distress related to the threat to family and work-life by the disease" were performed as follows. after the patient communicated with the nurse and increased information about the disease process, his stress was reduced, and he started to communicate with old colleagues and family through a virtual network. The patient was encouraged to think and focus on the positive aspects of life. His hope to continue family and work life has improved. The results of this intervention were obtained in a short time.

In the 3rd mode, the role function of the patient was in the primary role of a 66-year-old man, in the secondary role of the husband and father, and the 3rd role of the patient. He stated that he played the role of husband and father in the family, but others had adapted to his situation in the event of disease. He felt unable to perform his duties as a father and husband fully. He needed help with personal activities during hypertension and its associated symptoms. However, he could not eat. In this mode, the focal stimulus was the fear of being unable to take care of self and family, and the contextual stimuli

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were severe physical weakness, shortness of breath, and increased dependence on others.

In the mode of the patient's role-function adaptation, the following nursing diagnosis was made for the patient:

Primary role (66-year-old man) ineffective in association with severe physical weakness, pain, and increased dependence on others, and The secondary role is ineffective in relation to the inability to take care of self and family.

Accordingly, the nursing goals were determined in the following order

Perform the primary role effectively with less weakness and fatigue. Get help if needed and is willing to resume self-care activities independently.

Performs a secondary role effectively by expressing less anxiety and fear of not being able to take care of self and family

Nursing diagnosis interventions "primary role ineffective in association with severe physical weakness, pain and increased dependence on others" were performed as follows: daily program including activity courses and rest periods from the 2nd day of hospitalization in the form of stretching exercises for two 1st days (10 minutes) and then walking in the ward (every 15 to 20 minutes every two hours according to patient tolerance) was prepared. Measures to improve the patient's rest (e.g. restricting other members' activity while resting, minimizing noise, limiting treatment procedures to a shared time, sleeping half an hour to an hour in the morning and afternoon, helping with personal care, providing the necessary equipment close to his bed, massage, progressive relaxation, relaxing music). The patient was encouraged to maintain maximum independence in performing personal tasks. He was reminded that all dependencies and symptoms are temporary but that efforts must be made to maintain maximum independence. Positive feedback was provided after successful self-care behaviors. The patient's spouse played a very supportive role. After being discharged from the hospital, his spouse played this role well. The patient was allowed to do things he could do with support. With the measures taken and the recovery progress, the patient was no longer worried about his position. He did his best to do things independently and got help from those around him when needed. The following results were obtained in the medium term.

Nursing diagnosis interventions that are "secondary role ineffective in relation to the inability to care for self and family" were performed as follows: On the 2nd day of hospitalization, the patient was interviewed for 15 minutes. By repeating the previous explanations and providing positive feedback on the recovery process, he was helped to gain a correct understanding of fears and misconceptions. Information was provided on the prognosis of the disease, the temporary shortness of breath, and the lack of care for self and the child. After a consultation with the nurse, he felt empowered and received positive information and feedback. The following results were obtained in the medium term.

In the 4th mode, independence and dependence, the patient has an intimate relationship with his spouse and child. He has a good relationship with friends, neighbors, and relatives, but he thinks that only family members and himself can help him in this situation.

In this mode, the focal stimulus was the emotional distance from the spouse, and the contextual stimulus was the patient being hospitalized.

In the mode of independence and dependence, the following nursing diagnoses were made for the patient

Emotional inadequacy associated with emotional distance from spouse due to fear of recurrence of hypertension, and Disruption of social interactions in relation to the use of ineffective coping methods in the form of isolation from friends and family.

Accordingly, the nursing goals were determined in the following order

Increase emotional adequacy between the patient and the spouse.

Increase the quality and quantity of social interactions and connect with friends and family.

Interventions in the nursing diagnosis of "emotional inadequacy in relation to emotional distance with the spouse due to fear of re-hypertension" were performed as follows. Frequent voice and video contact with the family during non-sleep hours and the rest of the patient, especially when feeling nostalgia, was recommended. He was reminded that his distance from his family aimed to maintain their health. The patient enjoys talking to family and friends over the phone and via video. This action satisfied the patient in a short time.

Interventions in the nursing diagnosis of "disruption of social interactions in relation to ineffective coping meth-

ods in isolation from friends and family" were performed as follows: The patient was encouraged to express his feelings. He was reminded to try to communicate with family and loved ones daily, especially in times of nostalgia. In the 1st three days, due to the patient's need for rest, the family was called only once, but after that, the number of calls was according to the patient's needs. The patient's spouse was also informed that his relatives could communicate with him by voice and video, inquire about his condition and give positive feedback. The patient talked to the family daily. From the 2nd day of hospitalization, he was in contact with friends and colleagues. This action satisfied the patient in the medium term.

4. Discussion

Chronic diseases such as hypertension have debilitating cardiovascular, ocular, renal, and cerebral complications affecting all aspects of life. These consequences can affect the degree of adaptation to the disease life, including individuals' physical, mental, and social appearance [1].

Maladaptation and incompatibility with the disease and its complications can affect interpersonal relationships, clinical course, and disease prognosis. In chronic diseases, the patient's adaptation to long-term problems and complications is important and influential in controlling the disease and improving the quality of life [9].

This study, led by a case study, shows evidence of using a nursing process based on Roy's adaptation model in a patient with hypertension. From the point of view of Roy's adaptation model, human health is created when the disease is continuously adapted to stimuli by using effective coping mechanisms, and disease occurs when the coping mechanisms are ineffective [17].

In this model, nursing aims to help the person adapt or change in the four dimensions of adaptation that lead to health and quality of life, and death with dignity. Furthermore, according to this theory, health is the state and process and being and maintaining integrity as a whole. Adaptation is the process of improvement, promotion, and coherence of psychological and social physiology. Based on this model, the patient with the disease can achieve proper control and reduce its complications.

Roy's model is a suitable framework for collecting patients' data, and using this model causes the focus, organization, and guidance of the nurse's thoughts and actions toward the desired goals to be more effective and appropriate [10].

Most of the nursing diagnoses and patient maladaptation were focused on physiological problems. In general, the adaptation model is a non-invasive, non-pharmacological, and cost-effective method of controlling physical and psychological problems and can be easily implemented by nursing staff. As observed, the implementation of this model reduces the severity of physical and psychological problems in patients. This study also showed that monitoring the recommendations made in training and supervision sessions by the nurse had a positive effect on controlling the complications of the disease. Therefore, it is expected that conditions will be provided for the care program based on the Roy adaptation model for patients, especially patients with high blood pressure, to see the improvement of patients' conditions and reduction of complications, reduction of treatment costs, reduction of length of hospital stay, and more adaptation of patients to the existing conditions.

This study is in line with studies such as Maddineshat (2020) in patients with obsessive-compulsive disorder, Aghakhani (2019) in patients with colorectal cancer, and Mastaelizadeh (2018) in patients with diabetes [9, 10, 18]. Roy model is one of the models used in various studies in health education and health promotion of chronic diseases [8].

Since this study is a case study, it limits the number of discussions that can be considered and the generalizability of the methods and strategies used. Another limitation of this study is the short-term follow-up of the consequences of the nursing process after the patient's discharge because the appropriate structures for the follow-up of community-based nursing care in Iran are not well developed. However, this study is qualitative and shows real-life situations. An in-depth evaluation of this model makes it possible to identify different nursing diagnoses in the patient with other patients, which is in line with the nursing metaparadigm because humans are unique creatures, and each person's body responds differently to similar stimuli.

5. Conclusion

Roy's theory-based nursing process requires a nurse's individual and holistic attitude toward the disease and the patient's problems and providing a complete model of nursing care services, ensuring continuous contact with the patient. This issue is especially important in the age of technology development in modern medicine.

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Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this research. The patient's personal information was confidential and his consent was obtained during the investigation.

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Authors' contributions

The authors contributed equally to this study.

Conflict of interest

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