Application of Roy's Adaptation Model in nursing care for patients with end stage renal disease requiring hemodialysis

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This article details an application of Roy's Adaptation Model (RAM) in providing nursing care for patients with end stage renal disease (ESRD) experiencing changes associated with required haemodialysis (HD). RAM guides the assessment of the patients' levels of adaptation and facilitates the management of stimuli to promote their adaptation. The nursing intervention focuses on issues surrounding the adverse effects of HD treatment including physical, psychological, and social changes.

Keywords: Nursing care, end stage renal disease, hemodialysis, Roy's adaptation model.

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บทความได้นำเสนอการประยุกต์ใช้รูปแบบการปรับตัวของรอยในการพยาบาลผู้ป่วยไตวายระยะสุดท้ายกับประสบการณ์ที่ได้รับการฟอกเลือดด้วยเครื่องไตเทียม โดยได้นำเสนอแนวทางในการประเมินระดับการปรับตัว และการจัดการเกี่ยวกับสิ่งกระตุ้นต่าง ๆ ที่เกี่ยวข้องกับการปรับตัวของผู้ป่วย และการพยาบาลผู้ป่วยที่ได้รับการฟอกเลือดด้วยเครื่องไตเทียม ที่ครอบคลุมการเปลี่ยนแปลงทางด้านร่างกาย จิตใจ และสังคม

คำสำคัญ: *การพยาบาล; ไตวายระยะสุดท้าย; การฟอกเลือดด้วยเครื่องไตเทียม; รูปแบบการปรับตัวของรอย.*

Nursing is a healthcare profession to serve both the ill and the healthy to maintain their holistic well-being.[1] Thus, nurses use specialized knowledge to contribute to the need of society for health and well-being of the people. Within nursing the development and utilization of nursing models is an area of constant growth.[2] A nursing model has a significant effect on professional nursing practices, particularly in guiding the process of care while influencing their professional relationships with the patient. In order that a nursing model to render its full use within an area of practice, it must first be examined and clarified that the use really benefits both the nursing practice and the patients' outcomes.[2]

The main purpose of any nursing model is to guide nursing practice. It has been noted that Roy's Adaptation Model (RAM) is useful in all areas of nursing practice.[3] As for an individual nurse, applying RAM means using the knowledge of the model to assess individuals and groups, their adaptive and ineffective behaviors and the stimuli affecting them in addition to their level of adaptation. In collaboration with the person or groups involved, diagnoses are identified, goals set, interventions selected, and methods to evaluate the effectiveness of care are determined.[1]

The purpose of the article is to describe how nurses who work at dialysis centers facilitated their patients in coping with hemodialysis (HD). RAM[1] guides the assessment, diagnosis, planning, implementation, and evaluation of care for patients with end stage renal disease (ESRD) who require HD. This is because nurses play an important role in providing optimal dialysis, a supportive environment and comprehensive and continuous education. In addition, nurses can end up spending substantial amount of time with their patients so they can be well placed to improve the adaptation of their patients.

In performing this task, the authors will use citations from relevant literature, and use an example from a short case study.

Roy Adaptation Model

The Roy's adaptation model (2009) has served as a framework for practice in a variety of settings including internal medicine, [4-6] surgery, [7-8] oncology, [9-12] and community health. [13] The model was chosen as the framework for assessing and planning care for patients with ESRD who required HD due to its holistic perspectives on the individual concern and the process of adaptation. Sister Callista Roy, a sister of Saint Joseph of Carondelet, developed the Roy's Adaptation Model (RAM) in 1964 in response to a challenge by her professor, Dorothy E. Johnson. [14] Roy published her idea in 1970, and subsequently, different components of her framework were crystallized during the 1970s, 1980s, 1990s, and continued onto 21st Century.[15] RAM has been in use for 40 years, providing direction for nursing practice, education, and research. Extensive implementation efforts around the world, and continuing philosophical and scientific developments by the theorist, have contributed to model- based knowledge for nursing practice.[16]

Roy describes people, both individually and in groups, as holistic adaptive systems, complete with coping processes who are acting to maintain adaptation and to promote personal and environmental transformations. [16] Roy identified three types of stimuli that influence coping, namely: a focal stimulus which

refers to internal and external events that attract one's attention; contextual stimuli which refer to environmental factors that influence how individuals react to focal stimuli and include factors like age, socioeconomic status, family structure, knowledge, and beliefs; and, residual stimuli which refer to environmental factors that influence an individual but for which the influence is ambiguous. [4] Furthermore, the Roy's model categorizes these innate and acquired coping processes into two major subsystems, the regulator and the cognator. [1, 17] The regulator uses physiologic processes such as chemical, neurological, and endocrine responses to cope with the changing environment. The cognator subsystem involves the cognitive and emotional processes that interact with the environment. [16 - 17] Internal and environmental stimuli are processed by the regulator and cognator subsystems and result in behavioral responses that are observed through each of the four modes, [4] categorizing the effects of coping activity which are called adaptive modes. These four modes, initially developed for human systems as individuals, were expanded to encompass groups. They are termed the physiologic-physical, self-concept-group identity, role function, and interdependence modes. These four major categories describe responses to and interaction with the environment, and how adaptation can be observed (Figure 1). [16 - 17]

The goal of nursing is to promote health, in each of four adaptive modes, by maintaining adaptive responses and converting ineffective responses to adaptive ones. [18] To achieve the goal of nursing, nurses use the nursing process to assess an individuals' adaptation level and coping processes within the regulator and cognator subsystems, to identify problems, and to implement a plan of care that promotes their adaptation. [13] Roy has conceptualized the nursing process to comprise the following six simultaneous, ongoing, and dynamic steps: assessment of behavior, assessment of stimuli, nursing diagnosis, goal setting, intervention, and evaluation. [3,13]
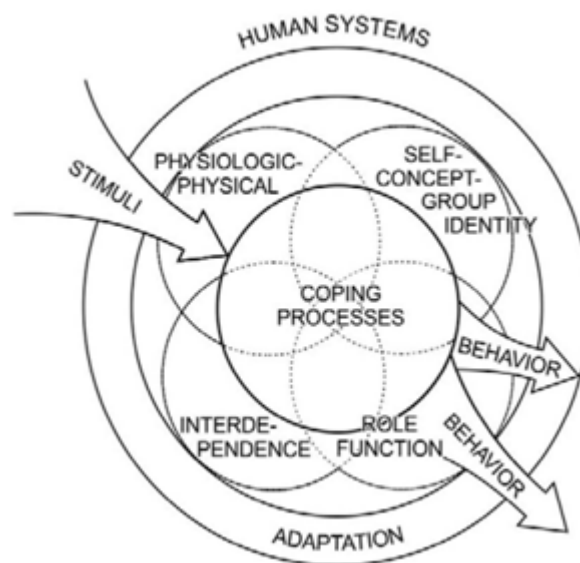

Figure 1. Adapted from diagrammatic representation of human adaptation systems. [1]

Patient background

In order to apply and illustrate the significance of RAM to the nursing process a case study of patients who suffered with ESRD and required HD will be used. The nursing assessment outline is for a 45-year-old woman, Noi, who was admitted with chronic kidney disease (CKD). For reasons of confidentiality the patient and name have been altered: she gave permission for the use of this case study and selected her own pseudonym.

Noi has been married to Sang for 15 years, and she has a 12-year-old daughter. Noi used to work at a hotel where her position was housekeeper for 5 years. Noi's husband was a security guard at a hospital in the city where they lived. Noi suffered from ESRD in which hypertension was the cause of her CKD. She was unconscious when she was first admitted. She was then put on ventilator and continuous ambulatory peritoneal dialysis (CAPD) until the symptoms improved. Then, she was moved to the general ward and discharged for 2 months. Having returned home, she gave up and refused treatment for HD because she though it would unnecessarily extend her life. She stopped the conventional treatment and consulted a doctor of Traditional Chinese Medicine (Doctor Mae) who prescribed her some medications. Her family hoped that her health would improve. However, her conditions deteriorated. She was readmitted to the hospital with volume overload, and uremia, and HD was then required. Noi has been receiving ongoing HD for 3 years. When she went to a hemodialysis center, the treatment continued, and she was fatigued and uncomfortable.

Noi's lifestyle has changed, since she has been on HD two to three times a week. These appointments also depended on the condition of her health. She suffered from fluid overload associated with hot or warm living conditions which often made her thirsty. She tried to control her water intake; yet again she failed several times to do this effectively. She promised her daughter that she would try to control her diet and water intake, but she never did it successfully. Another adverse effect was withdrawal from leisure and social activities due to her fatigue. She avoided taking a holiday, and exhaustion also affected her libido and interest in sex. As a result, her husband found a new wife which severely affected her mood.

These were major changes in her lifestyle. When she went out she was embarrassed, because her skin had darkened as a result of her conditions, and she also wanted to cover her vascular access sites. As for her treatment in the future, Noi refused renal transplantation (RT) as she though that she had lived long enough. After her husband found a new wife, she consulted her sister about her problems. Her husband tried to take responsibility to look after her, while also dealing with his new family. This caused further suffering for Noi, and as a result she became depressed and turned suicidal. Noi tried to cope with this stress by taking vows and promising to make an offering to the Buddha, given that her prayer became true. She committed to become a Buddhist nun for a short period of time.

Rational for choice of model

In the authors' opinion, RAM is a model of nursing that is particularly useful when considering

long-term adaptations of patients with ESRD who require HD regarding changes to their lives. These patients commonly associate the treatment with the adverse effects of HD. The following is a synthesis of the literature used to plan the care and educate the patients with ESRD who require HD. Therefore, the modes have been expanded to include groups, and are termed physiologic-physical, self-concept-group identity, role function, and interdependence. [19] Central to Roy's theoretical model is the belief that adaptive response supports health, which is defined as a state and a process of being and becoming integrated and whole. Nurses may end up spending substantial amount of time with their patients so they can be well placed to improve their patient's adaptation.

Noi will have to make many adaptations to different stimuli in her life with ongoing HD. ESRD was developed to identify factors that influence Noi's adaptation to HD treatment (Figure 2). The model required assessment in the following adaptive modes: physiologic-physical, self-concept-group identity, role function, and interdependence.
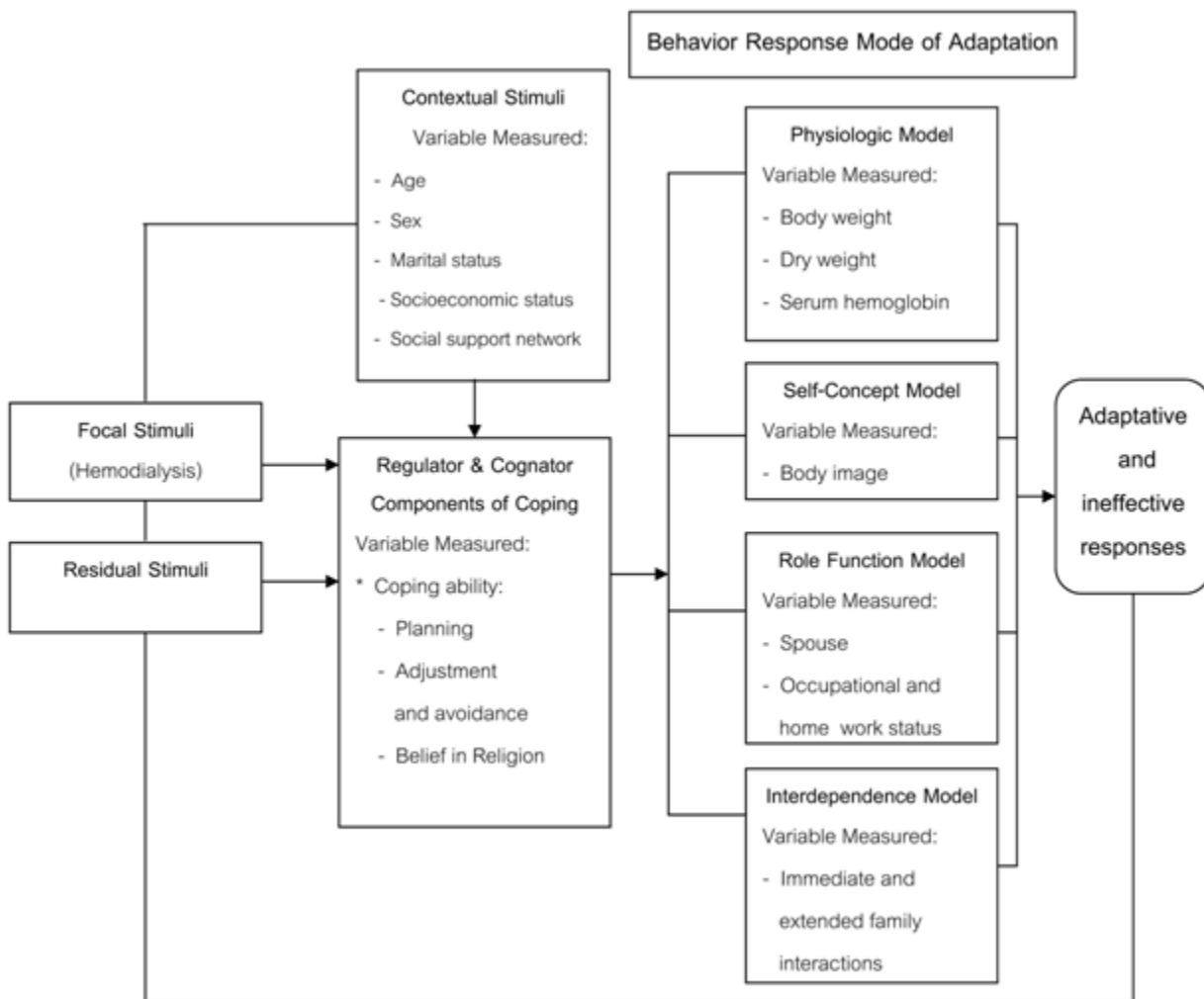

Figure 2. Schematic showing concepts of Roy's Model and the variable used to measure Noi's conditions.

Goal of Nursing

The goal of nursing in RAM is to promote adaptation in the four adaptive modes. This will enable the patient to be seen as an integrated and whole person. [19]

Nursing process

RAM encompasses six steps in the nursing process: assessment of behavior (first), assessment of stimuli (second), nursing diagnosis (third), goal setting (fourth), intervention (fifth), and lastly evaluation (sixth). The first and second steps of assessment will illustrate how the model can be used to assess a patient and formulate a nursing diagnosis.

Assessment

The first level of assessment

The first step in RAM is for the nurse to make a first level assessment. This is carried out by data collection. The nurse does this by interviewing the patient, measuring and observing. Once these data were collected, the nurse must decide what the patients' current level of adaptation is. The nurse identifies adaptive and maladaptive behaviors within four adaptive modes. Noi was undergoing HD, the major stressor exerted on her physical adaptive processes. To assess how good Noi was in coping with these stressors and draw up initial plan of care. A comprehensive assessment was performed.

Physiologic mode: The physical mode includes the physical and chemical processes involved in the function and activities of living organisms. The nurse will be knowledgeable about normal body processes to recognize compensatory processes and compromised processes of physiologic adaptation. The underlying need of the physiologic mode is physiologic integrity. Integrity has been defined as the degree of wholeness achieved by adapting to change in needs. When a person's physiologic needs are met, physiologic integrity is achieved. [1] Five needs are identified in the physiologic mode relative to physiologic integrity: oxygenation, nutrition, elimination, activity and rest, and protection. A discussion on physiologic adaptation includes two processes involving: senses (hearing, touch, vision and smell), body's fluid, electrolyte and acid-base, neurologic and endocrine function. With respect to Noi, the basic needs of fluid imbalance, and activities concerned were as follows:

Fluid imbalance: Fluid volume excess, or hypervolemia, water intake was restricted to 1000 ml/day, but Noi consumed more than 2000 ml/day. While receiving HD Noi constantly gained weight. So, fluid overload was a major problem and it was difficult for her to comply with fluid restrictions. In addition to reducing activity: she also walked for 5-10 minutes per day because was easily tried. Hence, hypervolemia and reduction of activities were identified.

Self-concept mode: Self-concept is defined as the composite of beliefs and feelings held about oneself at a given time. This is viewed as having two components. The physical self includes body sensation and body image. The personal self is composed of self-consistency, self-idea, and a moral-spiritual self. [1] Noi was concerned that her skin had darkened, and she was dissatisfied with her body image caused by HD access scarring. Moreover, Noi believed in the teachings of the Buddha. She tried to adapt by making vows to make an offering to the

Buddha. Her prayer or wish took the form of self-commitment to become a nun for one month if her request was fulfilled. To sum up, cognator and regulator processes were maintaining adequately adaptive response in the self-concept mode, but body image was identified to consider.

Role function mode: As for the perspective of the individual, the role function mode focuses on the roles that the individual occupies in society. A role, as the functioning unit of society, is defined as a set of expectations about how a person occupying one position behaves toward a person occupying another position. [1] Noi was a wife and a mother to a daughter who could not do any housework because she easily got tired after activities. Noi used to work at a hotel, but after hospitalization she resigned her job because she could not tolerate the activity involved. The lack of interest in sex led to separation from her husband and resulted in him finding a new wife.

Independence mode: The final mode focuses on relationships, such as the ability and willingness to accept and respond to respect, love and trust and value others. Receptive behaviors: Noi had accepted the help that had been offered in the form of HD. She was in a loving relationship with her daughter and her sister, but she did not trust her husband. Contributive behaviors: Noi offered information freely to help with the admission and assessment process. She considered that her husband would be taking her to the hemodialysis center.

The second level of assessment

The second level of assessment tries to assess what factors have contributed and will contribute to adaptive and ineffective behaviors demonstrated by the patient. A stimulus is any change in the internal or external environment that induces a response in the adaptive system. Stimuli that arise from the environment can be classified as focal, contextual, or residual. In this level of assessment, the nurse analyzes subjective and objective behaviors and looks more deeply for possible causes of a particular set of behaviors. [14] The focal stimuli that contribute most directly to an ineffective behavior should be the primary concern for the nurse. [13] Behavioral responses for the group are judged to be ineffective in four modes. Focal stimuli were influencing the self-concept mode as well as the interdependence mode. The relevant contextual stimuli include the following: time on HD, socioeconomic status, marital status, and social support network. In this case, the residual stimuli identified were religious belief and sexuality.

Analysis

Nursing Diagnosis

According to Roy and Andrews, [19] nursing diagnosis is a judgment process resulting in statements conveying the adaptive status of the human adaptive system. This interpretation is accomplished by considering behaviors assessed in the first level of assessment with the stimuli affecting those behaviors as assessed in the second level of assessment. [14, 20] As for clarification within the profession and the purposes of this article, the nursing diagnoses were stated using the North American Nursing Diagnosis Association's classification system. [21-23] Thus, the analysis of the information obtained during the assessment phase for Noi was

identified by the following nursing diagnoses: (1) fluid volume, excess, (2) activity intolerance, (3) sexual patterns, inactive, (4) suicide, at risk, (5) body image, disturbed, (6) religion, increased importance, and (7) caregiver role strained. This article illustrates only one diagnostic example of a nursing process that shows the application of RAM: disturbance in body image related to HD access scarring.

Goal Setting

Goal setting focuses on promoting adaptive behaviors. Together the nurse and the patient agree on a clear statement regarding desired behavioral outcomes of nursing care. The outcome statement should reflect a single adaptive behavior to be realistic, and measurable. The goal statement should include the behavior that needs to be changed, the change expected, and the time frame in which the change in behavior should occur.[14] The goal in the case of body image disturbed was that Noi would enhance confidence in her body image.

Intervention

According to Andrews and Roy[19] a nurse's intervention is any action taken by a professional nurse that he or she believes will promote adaptive behavior by the patient. Nursing interventions arise from a solid knowledge base and are aimed at the focal stimulus whenever possible. Intervention is any nursing approach that is intended: "To promote adaptation by changing stimuli or strengthening adaptive process,".[14] Nursing intervention in the case of Noi involves focusing on the stimuli affecting the behavior and managing the stimuli altering, increasing or decreasing, removing or maintaining stimuli as

proposed by RAM.[16] The nurse: (1) assessed perception of change in structural function of body part; (2) assessed impact of body image disturbance in relation to Noi's developed state; (3) encouraged verbalization of positive or negative feelings about the actual or perceived change; (4) taught Noi adaptive behavior such as use of adaptive equipment, cosmetics, clothing that conceals the altered body part or enhances remaining part or function; and (5) helped Noi identify ways of coping that could be useful in the part.

Evaluation

In RAM, the evaluation consists of one question: "Has the person moved toward adaptation?" The evaluation requires that analysis and judgment be made to determine whether those behavioral changes stated in the goal statement have, or have not, been achieved by the recipient of nursing care. In the evaluation phase, the nurse judged the effectiveness of the nursing interventions that have been implemented and determines to what degree the goals that had been mutually agree upon could be achieved.[14] The nurse attended Noi for two weeks at the hemodialysis center during the time she displayed more confidence. At that time Noi always wore long-sleeved clothes and sunglasses when she went out.

Summary

This article focuses on the RAM as a foundation for knowledge-based practice. The experience of nursing care for a patient with ESRD who required HD shows that the RAM can be used as a guideline that provides comprehensive

nursing care. In exploring the case study thoughts and feelings about dependence on HD led to fluid volume, excess, activity intolerance, sexual patterns, ineffective, suicide, at risk for-inflicted, body image disturbed, religiosity, readiness for enhanced, and caregiver role strain. Nursing interventions to help Noi changed ineffective behavior to adaptive and enabled to enhance all conditions. Therefore, RAM is an effective guidance for nursing practice in providing care for patients with ESRD required HD.

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