



Roy Adaptation Model: integrative review of studies conducted in the light of the theory

Modelo de Adaptação de Roy: revisão integrativa dos estudos realizados à luz da teoria

Modelo de Adaptación de Roy: revisión integradora de los estudios realizados a la luz de la teoría

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Objective: to identify the scientific evidence about the components of the Roy Adaptation Model in the population studied in the light of this theory. **Methods:** this is an integrative literature review in databases of the Latin-American and Caribbean Center on Health Sciences Information, Medical Literature Analysis and Retrieval System Online, Spanish Bibliographic Index on Health Sciences, Nursing Database, PubMed Central, Cumulative Index to Nursing and Allied Health Literature, Web of Science, and SciVerse Scopus. The sample consists of 20 articles published between 2005 and 2013. **Results:** the three types of stimuli, 38 of 82 adaptive problems, the four adaptive modes, and the six steps of the nursing process were identified. **Conclusion:** there is need for further studies on this theory and that address the entire nursing process, culminating in the increase in specific nursing knowledge and affirmation of this science in health.

Descriptors: Nursing Theory; Models, Nursing; Adaptation, Physiological; Adaptation, Psychological.

Objetivo: identificar as evidências científicas acerca dos componentes do Modelo de Adaptação de Roy nas populações estudadas à luz dessa teoria. **Método:** trata-se de uma revisão integrativa da literatura nas bases de dados Literatura Latino-Americana e do Caribe em Ciências da Saúde, *Medical Literature Analysis and Retrieval System Online*, Índice Bibliográfico Espanhol de Ciências da Saúde, Base de Dados de Enfermagem, PubMed Central, *Cumulative Index to Nursing and Allied Health Literature*, *Web Of Science* e *SciVerse Scopus*. A amostra é constituída de 20 artigos publicados entre os anos 2005-2013. **Resultados:** Foram identificados os três tipos de estímulos, 38 dos 82 problemas adaptativos, os quatro modos adaptativos e as seis etapas do processo de enfermagem. **Conclusão:** há necessidade da realização de estudos sobre essa teoria e que abordem todo o processo de enfermagem, culminando no aumento do conhecimento específico da Enfermagem e afirmação dessa ciência na área da saúde.

Descritores: Teoria de Enfermagem; Modelos de Enfermagem; Adaptação Fisiológica; Adaptação Psicológica.

Objetivo: identificar las evidencias científicas acerca de los componentes del Modelo de Adaptación de Roy en poblaciones estudiadas a la luz de esta teoría. **Método:** revisión integradora de la literatura en las bases de datos Literatura Latinoamericana y Ciencias de la Salud del Caribe, *Medical Literature Analysis and Retrieval System Online*, Índice Bibliográfico Español de Ciencias de la Salud, Base de Datos de Enfermería, PubMed Central, *Cumulative Index to Nursing and Allied Health Literature*, *Web Of Science* e *SciVerse Scopus*. La muestra constó de 20 artículos publicados entre años 2005-2013. **Resultados:** se identificaron tres tipos de estímulos, 38 de los 82 problemas de adaptación, los cuatro modos de adaptación y los seis pasos del proceso de enfermería. **Conclusión:** hay necesidad de estudios sobre esta teoría que aborden todo el proceso de enfermería, culminándose en aumento de conocimientos específicos de enfermería y afirmación de esta ciencia en salud..

Descriptor: Teoría de Enfermería; Modelos de Enfermería; Adaptación Fisiológica; Adaptación Psicológica.

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Introduction

Nursing theories can be described as an articulated and communicated concept of reality aimed at describing, predicting, and prescribing nursing care⁽¹⁾.

Researchers have developed the scientific discipline of nursing, which through the theories directs research, improves the practice and therefore the patient outcomes. The evolution of theories and research with these purposes require an effort to determine what has been accomplished, what is being done, and what still needs to be construct in order to support and continue the discipline of nursing as a science and as a profession⁽²⁾.

As an example of nursing theory, there is the Roy Adaptation Model, which constitutes a basis for understanding the individual as a system able to adapt. The person is the recipient of nursing care. Health consists in a state and a process of becoming a full and integrated person. The environment includes all the conditions and circumstances that affect the behavior and development of someone. Finally, the goal of nursing is to promote adaptive responses concerning the four adaptive modes (physiological, self-concept, role function, and interdependence)⁽³⁻⁴⁾.

This model sees the person as a holistic and adaptive system. The input through stimuli activates regulatory and cognitive mechanisms that act to maintain the adjustment from the adaptive modes. The outputs of people, as systems, are their responses, that is, the behavior of the person. Output responses become feedback for the person and the environment and are categorized as adaptive responses: promote the integrity of the person, which is demonstrated through behavior when they are able to meet the goals in terms of survival, growth, reproduction, and domain. Ineffective responses do not support these goals^(1,4-5).

Individuals have several adaptive needs, especially when the health standard is altered. In this context, the Roy Adaptation Model becomes relevant

in the practice of nursing care based on specific knowledge of this area. Additionally, there is need for a survey on the production of studies in the light of this theory in order to identify limitations and support further research on this issue. For this reason, this study aimed to identify the scientific evidence about the components of the Roy Adaptation Model in different populations studied in the light of this theory.

Method

This is an integrative literature review that summarizes the available research on a specific topic and conducts the practice based on scientific knowledge⁽⁶⁾.

For the construction of this study, the following steps were used: theme identification and formulation of the research question, establishment of inclusion and exclusion criteria of studies, definition of data to be obtained from selected studies, categorization of studies, assessment of selected studies, interpretation of results, and presentation of information synthesis⁽⁷⁾.

In order to conduct this review, the following guiding questions were formulated: What are the structural components of the Roy Adaptation Model found in the literature? What are the most common types of stimuli? What are the most studied steps of the nursing process in the light of this theory? The search strategy step occurred in October 2014, in the databases of the Latin-American and Caribbean Center on Health Sciences Information (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE), Spanish Bibliographic Index on Health Sciences (IBECS), Nursing Database (BDNF), PubMed Central, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Web of Science, and SciVerse Scopus (SCOPUS).

During the survey of publications, controlled descriptors, in English, of the MeSH – Medical Subject Headings were used: “Nursing Theory” and “Nursing Model”, through the Boolean operator AND. These descriptors were chosen due to the absence of one

related to the Roy Adaptation Model.

The research included the studies that met the following criteria: scientific articles in English, Portuguese and Spanish; published between 2004 and 2014; available online, free and in full-text; and that presented the components of the Roy Adaptation Model in its results. The studies in editorial format, letter to the editor, and literature review were excluded.

Restrictions on publication period occurred due to the high number of studies found in the databases, given the use of descriptors covering all Nursing theories.

After full reading of the articles selected in the previous step, the articles that composed the final sample of this integrative literature review were defined.

To obtain the studies of interest that comprised the final sample, 16,726 studies were described quantitatively following the steps conducted in the databases. Each database obtained a quantitative: MEDLINE= 489; LILACS= 94; BDNF= 45; IBEC= 7; CINAHL= 2,244; SCOPUS= 1,868; PUBMED= 10,485; and WEB OF SCIENCE= 1,494. Potentially relevant studies: MEDLINE= 11; LILACS= 11; BDNF= 5; IBEC= 0; CINAHL= 4; SCOPUS= 23; PUBMED= 2; and WEB OF SCIENCE= 21. Duplicate studies excluded: MEDLINE= 0; LILACS= 0; BDNF= 5; IBEC= 0; CINAHL= 1; SCOPUS= 3; PUBMED= 0; and WEB OF SCIENCE= 11. Lastly, studies selected for full reading: MEDLINE= 5; LILACS= 7; BDNF= 5; IBEC= 0; CINAHL= 3; SCOPUS= 16; PUBMED= 2; and WEB OF SCIENCE= 11.

Following the eligibility criteria, the final sample consisted of 20 articles, with 04 of MEDLINE, 07 of LILACS, 06 of SCOPUS, 01 of PUBMED, and 02 of WEB OF SCIENCE.

Results

Descriptive studies conducted in Brazil and with level of evidence VI were predominant. About the stimuli, Table 1 shows the studies that presented them.

Table 1 - Distribution of studies based on the types of stimuli of Roy Adaptation Model

Stimuli	Studies
Focal	8; 9; 10; 11; 12; 13;14; 15; 16; 17; 18; 19; 20; 21; 22; 23; 24; 25
Contextual	8; 9; 12; 15; 16; 17; 18; 19; 21; 22; 23; 24; 25
Residual	9; 18; 23

The adjustment problems listed by Callista Roy and the adaptive modes are important components of the Model. Most adaptive problems have been identified in the physiological mode, and 38 of the 82 adaptive problems listed in the theory were observed in the studies (Figure 1).

For this reason, the nursing process, consisting of six stages, is also a part of this theory (Table 2).

Table 2 - Distribution of studies on the steps of the Nursing Process in the light of the Roy Adaptation Model

Steps of Nursing Process	Studies
Behavioral research	8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 19; 21; 22; 24; 26
Stimuli research	8; 9; 10; 11; 12; 13; 14; 15; 16; 17; 18; 19; 21; 22; 23; 24; 26
Nursing diagnosis	8; 9; 11; 15; 16; 19; 20; 24
Goal setting	8; 11; 20; 24
Implementation plans	8; 9; 11; 17; 24
Evaluation	8; 11; 17; 24

Adaptive modes	Adaptive problems	Studies	n (%)
Physiological	Impaired skin integrity	11; 12; 13; 14; 16	5 (25.0)
	Nutrition higher or lower than physiological requirements	11; 16; 22; 25; 26	5(25.0)
	Acute pain	12; 15; 20; 21	4(20.0)
	Inadequate pattern of activity and rest	17; 20; 22; 26	4(20.0)
	Nausea and vomiting	8; 19; 22; 26; 27	5(25.0)
	Edema	12; 16; 26	3(15.0)
	Intolerance and activity	12; 16; 26	3(15.0)
	Injury potential	12; 15; 20	3(15.0)
	Mobility to walk and/or restricted coordination	12; 15; 16; 27	4(20.0)
	Constipation	9; 15; 16	3(15.0)
	Bowel/bladder incontinence	16; 22; 26	3(15.0)
	Loss of self-care ability	17; 24	2(10.0)
	Ineffective coping with changes in the immune status	10; 14	2(10.0)
	Sleep deprivation	12; 15	2(10.0)
	Ventilatory impairment	11; 26	2(10.0)
	Acid-base imbalance	16; 19	2(10.0)
	Intracellular water retention	12	1(5.0)
	Primary sensory impairment	12	1(5.0)
	Chronic pain	12	1(5.0)
	Stress	17	1(5.0)
	Infection	13	1(5.0)
	Sensory distortion	16	1(5.0)
	Itching	16	1(5.0)
Bedsore	16	1(5.0)	
Potential for disturbance in sleep patterns	16	1(5.0)	
Weight 20/25% above or below the average	16	1(5.0)	
Self-concept	Anxiety	9; 12; 17; 20; 21; 22; 24	7(35.0)
	Body image disturbance	8; 13; 14; 17; 19; 26	6(30.0)
	Low self-esteem	10; 12; 13; 17; 19	5(25.0)
	Sexual dysfunction	12; 14; 15; 22	4(20.0)
	Impotence	9; 15; 24	3(15.0)
	Loss	12	1(5.0)
Role function	Role distancing	10; 13; 14; 15; 19; 26	6(30.0)
	Role failure	8; 22; 26	3(15.0)
	Role conflict	22; 25	2(10.0)
Interdependence	Ineffective loneliness and relationship pattern	13; 17; 19; 22; 26	1(5.0)
	Separation anxiety	24	1(5.0)
	Ineffective pattern of giving and receiving nutrition	8	1(5.0)

Figure 1 - Distribution of studies according to the commonly recurring adjustment problems listed by Callista Roy

Discussion

There is a significant deficit in the number of scientific production on nursing theories, especially the Roy Adaptation Model, which subsidize nursing as a health science.

Regarding the Roy Adaptation Model, only 6.4% of national publications about nursing theories contextualize this framework. Similarly, study report 7.5% of national articles approaching nursing theories that address the Adaptation Model^(2,28-29).

Stimulus represents the element, whether internal or external, that arouses the answer and include all the conditions, circumstances and influences around the person, or that affects their development or behavior. In this theory, the term “environment” defines the set of stimuli that interacts with the person⁽⁴⁾. These stimuli can be divided into focal, contextual, and residual. Focal is the most important, as it directly deals with the person; the contextual is defined as another stimulus evident in the situation and that contributes to the behavior

caused by focal stimulation; and the residual, which has indeterminate effect on the person's behavior⁽³⁻⁴⁾.

Most studies revealed focal and contextual stimuli, given the difficulty in identifying residual stimuli during the adaptive process of the different populations studied and the clear and objective way these stimuli were presented.

Stimuli activate innate or acquired coping mechanisms to respond to environmental changes, which are divided into two subsystems: regulatory, that receives stimulus and displays output through autonomic reflex response, i.e. chemical, neural or endocrine transmitters; and cognate, which receives stimuli and responds to them by four cognitive and emotional channels: perceptual/information processing; learning; judgment; and emotion. These mechanisms will trigger the abovementioned responses^(1,4,30).

In maintaining the person's integrity, the regulatory and the cognate subsystems act together. The level of adaptation, as adaptive system, is influenced by the individual development and the use of these coping mechanisms. Behaviors resulting from the regulatory and cognate subsystems can be observed in four categories or adaptive modes: physiological, self-concept, role playing, and interdependence^(1,4).

The physiological mode is defined as the way people respond to environmental incentives as a physical individual. It is associated with physical and chemical processes involved in the functions and activities of living organisms. In this mode, the basic need is the physiological integrity and the behavior is the expression of physiological activities of all cells, tissues, organisms, and systems in the human body. There are five needs related to the basic needs of physiological integrity identified: oxygenation, nutrition, elimination, activity and rest, and protection. Furthermore, this mode includes four complex processes involving feelings, fluids and electrolytes, neurological function, and endocrine function^(4,22,30).

The physical aspects of individuals cause

considerable impact on the quality of life. The relationship between the physical aspects of quality of life and the perception of them is associated with the ability to work, energy levels for daily activities, and transport⁽³¹⁾. Corroborating, elderly people with negative perception of the physical domain are about four times more likely to have a negative health perception⁽³²⁾. Health perception represents an indicator associated with the decline in functional autonomy and capacity, demonstrating the personal interpretation that individuals have on their own health⁽³³⁻³⁵⁾.

Several adaptive problems negatively influence the quality of life of individuals, such as urinary incontinence, activity intolerance, inadequate pattern of activity and rest, sleep deprivation, chronic pain, and nutrition higher or lower than physiological requirements⁽³⁶⁻⁴⁰⁾.

The self-concept mode is one of the three modes that address the psychosocial aspects of people. Psychic integrity is the basic need of this mode, consisting of two categories: the Physical self, which has the body feeling and body image as components; and Personal self, which consists of self-consciousness, the self-ideal, and the moral-ethical-spiritual self⁽³⁻⁴⁾.

Body feeling is the ability to feel and experience yourself as physical being. Body image can be understood as a three-dimensional image, involving psychological, sociological, and physiological aspects that individuals have of themselves. Self-consciousness is part of the personal component of self that resists maintaining consistent self-organization and thus avoiding the imbalance. The self-ideal is represented by what the person would like to be. Finally, the moral-ethical-spiritual self deals with what the person believes, in other words, represents the person's belief system and an assessment of who they are^(3-4,41).

Many people need to face the stimuli caused by this mode. Ostomized people, with venous ulcers, and women with breast cancer demonstrate the significant impact that the change in body image cause

in a person's self-esteem and quality of life. The new body configuration of those with ostomy, the presence of ulcer, mastectomy, and changes caused by chemotherapy and radiotherapy also affect their sexuality, resulting in a significant adaptive demand^(14-15,42).

About the function mode in real life, the Model addresses the roles that the person has in society. Social integrity is the basic need in this mode. It identifies the patterns of social interaction of the person towards others reflected by the primary, secondary, and tertiary roles. The primary role determines the majority of behaviors and is defined by gender, age, and stage of development of the person. The secondary performs the tasks required by the developmental stage of the primary role. And the tertiary role is temporary, which can be represented by hobbies^(1,4,43).

The transition of roles can be defined as the process of taking and developing a new role. It constitutes growing in a positive meaning and is incompatible with the individual's tasks of the primary role. In the role distancing, the individual presents appropriate behaviors for a given behavior, but these differ from those expected for this role⁽⁴⁾.

Role conflict occurs when the individual fails in showing the appropriate behaviors to a role because of incompatible expectations of one or more persons in the environment associated with the person's behavior. Finally, in the role failure, people does not show significant behaviors or present some ineffective for a particular role⁽⁴⁾.

Changes in behavior, with regard to this mode, as the concern to perform the role imposed by society, with respect to gender, afflicts women with cancer who, in some cases, need to reverse their primary and secondary roles with the partner during treatment. People undergoing cardiac catheterization indicated changes in labor activities, such as temporary absence, demonstrating once again the distress of people when there is a role change^(10,15).

Lastly, the interdependence mode focuses on interpersonal relations, in other words, interactions

related to giving and receiving love, respect and value through relationships with significant others and support systems. The basic need in this mode is the affective adequacy, which is associated with the feeling of safety in food relations^(4,44).

It is known that the support systems comprise all persons, groups or animals that contribute to meet the interdependence needs of someone, for example, the spouse and nursing professionals have great importance during the adaptation process. Moreover, support groups, through educational interventions, the exchange of experience and mutual assistance also promote psychosocial adaptation of several people^(43,45-47).

The Nursing Process in the Roy Adaptation Model consists of six steps that encompass behavioral research, which is based on the collection of responses or output behaviors of people concerning the four adaptive modes. Customer evaluation in each of the four adaptive modes strengthens a systematic and holistic approach and the information collected includes objective, subjective and measurement data⁽¹⁾.

The second step is the stimuli research, analyzing the emerging issues and customer behavior patterns to identify ineffective or adaptive responses that require their support. Whenever there is ineffective behavior or adaptive responses requiring support, nurses conduct an investigation of external and internal stimuli that may be affecting these behaviors⁽¹⁾. Therefore, Nursing Diagnosis can occur from three methods: using the commonly recurrent adaptive problems, reporting the observed response together with the most influential stimuli, or summarizing the responses in one or more adaptive modes related to the same stimulus⁽¹⁾.

The fourth step, goal setting, comprises the final behaviors that people should achieve. Implementation plans that aim to change or control the focal or contextual stimuli. Finally, there is the evaluation, when behavioral goals are compared with the person's output responses and a movement toward or away from the goal achievement is determined^(1,4).

Conclusion

Studies on the Roy Adaptation Model were developed in different populations with particular adaptive needs, as proposed by the theorist Callista Roy. The three types of stimuli, 38 of the 82 commonly recurrent adaptive problems and the six steps of the Nursing Process described in the model were identified. The evaluation of the adaptive process in the light of this theory enabled to approach people and groups holistically, understanding them as systems capable of showing effective adaptive responses to the stimuli.

In the present study, most documents focused only on the first two steps. Those that include interventions and evaluation of the adaptive process are very limited.

Lastly, the contribution of this study to Nursing is based on the production of its specific knowledge, reaffirming it as a health science, verifying the need for further studies in this area. The combination of this model with the Nursing Process, from the NANDA-I Nursing Diagnoses, promotes specific knowledge and contributes to autonomy in nursing practice, based on science health different from others.

Collaborations

Medeiros LP and Costa IKF contributed to the work design, analysis, data interpretation, drafting of the article, and final approval of the version to be published. Souza MBC, Melo MDM, Sena JF and Costa JWS contributed to data collection and drafting of the article.

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