Special Article

Health Promotion and Exercise Planning Older Person with Post-Stroke; Roy's Adaptation Theory Approach: A Protocol

Wantonoro, BSN, MSN, PhD, RN
School of Nursing, Aisyiyah University, Yogyakarta, Indonesia

Correspondence: Wantonoro, Faculty of Nursing, Aisyiyah University, Yogyakarta, Indonesia. Jalan Ringroad Barat No.63, Mlangi Nogotirto, Gamping, Area Sawah, Nogotirto, Kec. Gamping, Kabupaten Sleman, Daerah Istimewa Yogyakarta 55592 Email: oneto_ns@yahoo.com

Abstract

This paper esthablished the health promotion and exercises planning for older person post-stroke useing the Roy's Adaptation theory. It challenges evidence in roadmap and strategies based on the nursing theories for health promotion and exercise program for older person who had stoke in the clinical setting area. Roy's Adaptation theory focused in patients adaption process with their condition, including physical (physiologic) and psychosocial (self-concept, role function, and interdependence).The development and application promotion and exercises planning for older person post-stroke using the Roy's Adaptation theory model is recommended for clinincal setting and future study.

Keywords: Roy's Adaptation theory**,** promotion , exercises , post-stroke

Introduction

Health promotion is the process of enabling people to increase control over, and to improve, their health (World Health Organization, 2017). The emphasis on health promotion and disease prevention has greatly intensified in the United States during the past two decades (Smith & Maurer, 1995; Glanz et al., 1997). Health promotion has been a public concern in the worldwide (Kumar & Preetha, 2012). In nursing, health promotion to be a major focus for nursing as is reflected in the American Nurses' Association (ANA) Social Policy Statement (Spellbring, 1991).

Nurses must have an evidence-based understanding of the significant effect that can be made through health promotion interventions and communicate this understanding to the public at large (Chiverton et al., 2003). Given the complexity of health promotion practice and comprehensive interventions, develop effective programs are needed. The use of theory-based interventions within population has shown variability across the behaviors that have been targeted (Abdi et al, 2015). The nursing theory provides a roadmap and strategies and relevant clue as to the ways an intervention is necessary, and how to intervene, how to evaluate (Saffari et al., 2012). Therefore, nursing theory is becoming important in basic on health promotion.

Theory overview

Roy's Adaptation theory is one of nursing theories used in nursing practice, including health promotion, education and the research (Aligood &Tomey, 2010). Roy's Adaptation theory is derived from Helson's psycho-physics theory and developed by practical experience and a step-by-step model to promote adaptation in situations of health and illness in the four adaptive modes (Roy, 1984). The Roy's Adaptation theory offers a conceptual model for the development of nursing knowledge and the description and also predictions of the nursing care necessary to promote the health of individuals or groups. Roy defines nursing as 'a health care profession that focuses on human life processes and patterns and emphasizes the promotion of health'. Further, the role of the nurse is to promote adaptive responses in during health or illness (Roy, 1984; Chinn & Kramer, 1995). The

recipient of nursing care is an individual, a family, a group, a community, or society whole, open, adaptive system (Roy & Andrews, 1991).

The concept of adaptation is the central focus in Roy's Adaptation theory. Adaptation defines as 'the process and outcome whereby thinking and feeling persons, as individuals or in groups, use conscious awareness and choice to create human and environmental integration'. Roy posits that as adaptive systems, people or groups (1) experience stimuli from the environment (inputs); stimuli are factors contributing to the behaviors, those things which provoke a response; focal, contextual, and residual stimuli (2) develop coping mechanisms (control processes), the coping processes are broadly described within the regulator and cognator subsystems, and (3) produce responses (outputs) and these responses may be adaptive or ineffective.

Principles of health promotion are to empowerment, it enables people to gain greater control over decisions and actions affecting their health and where people take an active part in decision making (World Health Organization, 2017). The goal of nursing intervention is to maintain and enhance adaptive behavior, and to change ineffective behavior to adaptive, thus contributing to the health, quality of life and dying with dignity (Roy& Andrew, 1999). Behavior can be observed in four categories; physiological-physical, self concept, role function, and interdependence mode (Roy, 2009).

The physiological mode, represented by the physical health of the person, is associated with physical and physiological responses to stimuli from the illness or a change in clinical status. The self-concept mode, represented by emotional health, focuses on the person's conceptions of his or her psychological and spiritual dimensions. The role function mode, represented by functional status, is concerned with how the person performs on the basis of his or her position in society, including both instrumental and expressive behaviors. Interdependence mode, represented by the quality of relationships with significant others and other support systems, deals with the development and maintenance of satisfying affectional relationships and community support (Roy & Anderews, 1991, 1999).

The basic type of the adaptive process (control process) is the regulator and cognator subsystems respond. The regulator subsystem responds through neural, chemical, and endocrine coping channels. Internal and external environment act as inputs through the senses to the nervous system, thereby affecting the fluid, electrolyte and acid-base balance, as well as endocrine system. While, cognator subsystem is the response through four cognitive-emotional channels: perceptual and information processing (includes activities of selective attention, coding, and memory), learning (involves imitation, reinforcement, and insight), judgment (including problem-solving and decision making), and emotion (Roy, 2009, Aligood &Tomey, 2010). The regulator and cognator function to maintain integrated life process are manifested in the behaviors of the individual or group, it is an adaptive or ineffective response.

The cognitive-emotional channels as cognator subsystem is an important part contributed in adaptive process, in Roy's adaptation theory. The empirical study provided support for Roy's adaptation theory and the theoretical postulate that cognitive efforts bring about adaptive responses such as the maintenance of self-consistency (Mock et al., 1997; Zhan, 2000). Finally, we designed a program based on Roy's Adaptation theory emphasize in the cognator subsystem and the regulator subsystem as becoming a basic on health promotion program process, in order to maintain and increase adaptive mode (behaviors) contributing to the health.

Roy's Adaptation Theory applied for general population health promotion

Roy's Adaptation theory is used for theory building and for driving middle range theories for testing, and generalizable to all setting in nursing practice, primarily address the person-environment adaptation of the patient (Aligood &Tomey, 2010). The re-conceptualized Roy's Adaptation theory presented as a theoretical framework for general population health nursing practice in the health promotion movement during healthy or illness conditions (Chinn & Kramer, 1995; Dixon, 1999). General population viewed as systems which made up of many parts, and as influenced by many internal and external variable. The members, resources, and functions are an integration of a

general population's part (Hanchett, 1990). The specific attention is paid to the performance of assessments within the adaptive modes that relate to collectives functions such as the physical, group identity, role function, and interdependence modes in the Roy's Adaptation theory which applied to the general population (Dixon, 1999). The Roy's Adaptation theory has been used in many stetting including applied for general population's health promotion (Aligood &Tomey, 2010).

Roy's Adaptation theory to promote physical activity (intensive exercise program) among post-stroke patients

Stroke survivors have trouble moving around, about 40 percent have serious falls within a year of their strokes, exercise program improves balance and ability to move (Baranski, 2010). Based on Roy's adaptation theory, we design health promotion; intensive exercise program post-stroke to promote functional recovery as an adaptive mode. Especially the first-time-ever stroke patient's diagnosis without subarachnoid bleeding; tumor; other serious illness; and brainstem or cerebellar stroke and without cognitive impairment by physician judgment. Mildly affected by stroke: weakness in the affected arm and leg, but have some ability to control movements, able to walk without someone's assistance, but may use a walker, cane or brace and able to communicate by nurses observation. The post-stroke patients as a bio-psycho-social being who is able to adapt to environmental stimuli categorized as focal, contextual, or residual. Post-stroke problem such as paralysis is viewed as the focal stimulus, which leads to maladaptive responses for post-stroke patients. Contextual stimuli are indirectly related to the focal stimuli such as mobility and personal beliefs. The residual are all other stimuli that affect the focal and contextual stimuli such as relationships with family and friends or support system for post-stroke patients. Adaptation is assess and measures in physical (physiologic) and psychosocial (self-concept, role function, and interdependence) modes; (1)physiologic-physical, measures physical function, the level of activity and function; (2) self-concept, the composite of beliefs including feelings one has of oneself at a given time operationalized as confidence to exercise or self-efficacy; (3) role function, a set of expectations about how a person functions after intensive exercise program and relates with others; and (4) interdependence, giving and receiving information via nurturing relationships in intensive exercise program process. While all of these modes are important, this program will focus on adaptation to post-stroke patients using Roy's theoretical physiologic-physical and self-concept modes to evaluate the effect health promotion; intensive exercise program post-stroke on physical function and personal beliefs.

Roy's conceptualization of adaptation defines a post-stroke patients as in a maladaptive state due to an inability to regulate their physiological and psychological state. Adaptation occurs when the coping mechanisms (cognator and regulator subsystems) are stimulated (Rogers & Keller, 2009). Coping mechanisms refer to innate or acquired process that the person uses to deal with environment stimuli (Aligood &Tomey, 2010). Health promotion will promote adaptation by enhancing the coping mechanisms (regulator and cognator subsystem) to increasing adaptation. The regulator subsystem will enhance adaptation through the physical. Intensive exercise program post stroke focused on intensive functional endurance, strength, and balance exercises. The goal of these exercises was to maintain and/or improve grip strength, muscle tone, walking capacity, balance, and quality of life. The cognitive function of the cognator allows post stroke patients to obtain knowledge and promote adaptation through increased cognitive-emotional channels: perceptual and information processing, learning, judgment, and emotion on an intensive exercise program such as the importance of exercise, motivation to exercise, and whether and how they were doing exercises and what kind of exercises (figure 1). The schedule was provided to health promotion program (table 1) and the intensive exercise program protocol on post-stroke patients were adapted from Langhammer, Stanghelle, & Lindmark (2009) (table 2).

Procedure: We invite the eligible patients to participate the program in six- weeks duration and 1st moth follow-up after programs. Ist week is a health promotion; intensive exercise program post stroke patients by trained nurse in a group session. Then, intensive exercise program by a trained nurse in the 2nd to 5th week, with the patients who agree to participate by their self-judgment after

promotion program. The intensity, time, type of intensive exercise program will follow patient's tolerance or ability, and increase step-by-step following the regulator coping mechanisms. Hence, it is the individual exercise with duration 40-60 minutes per session, 3 times per week (day 1, 3 and 5 each week).

The day 7 per week is a short evaluation, patient groups meeting at the convenience room and give support and motivate their self and other. Then, the trained nurse will test or assess individual patient using the instruments (table 3). The final evaluation is in the 6th week and 1st month after promotion;intensive exercise program, the trained nerse will test or assess individual patient using the instruments (table 3).

Strategies to evaluate proposed program.

The expected outcomes of these programs are to maintain and enhance adaptive behavior, and to change ineffective behavior to adaptive. Behavior will observe in physiological-physical, role function, self-concept, and interdependence mode (Roy, 2009). Self motivation (self-concept) to participate in the intensive exercise program and improves of mobility (physiological-physical) as an adaptive behavior.

Instruments: The outcome measure instrument for physical (physiologic) are the digital vital sign, Berg Balance Scale (BBS), Timed Up and Go (TUG), 6-Minute Walk Test (6MWT), and Motor Assessment Scale (MAS). While, The Short form-36 (SF-36) will use to measure all behavior; physiological-physical, role function, self-concept, and interdependence mode (table 3)

The Berg Balance Scale (BBS) is a balance test consisting of 14 items, scored from 0 (no balance) to 4 (full balance) (Berg et al. 1995). Timed Up and Go (TUG) is a functional mobility test that is used in the clinic to evaluate dynamic balance, gait, and transfers.

The patient is asked to get up from a chair (46cm high), with support for the arms, walk three meters, turn, go back, and sit down (Podsiadlo & Richardson, 1991).

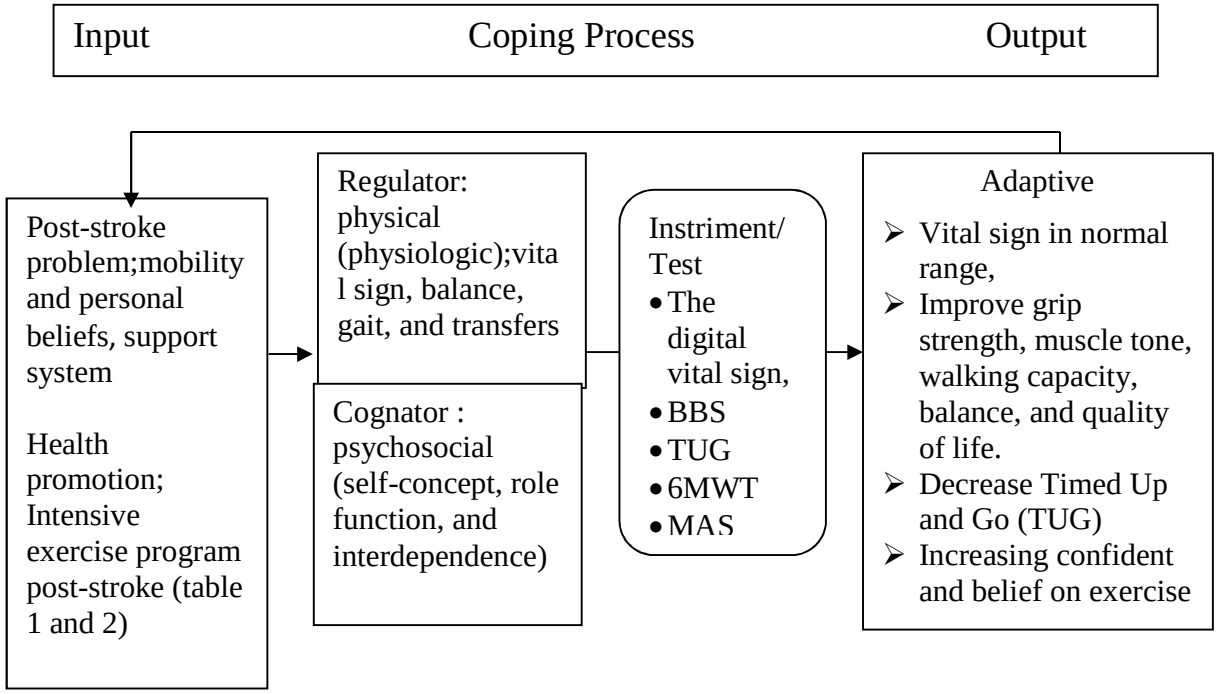

Figure 1. Health promotion; Intensive exercise program among post stroke patients based on Roy's adaptation theory

Table 1.The health promotion program on post-stroke patients

1st Week	Day 1 Introduction: causes of stroke and the problems after stroke ✓ To provide information about the causes of stroke ✓ To provide information about the problem after problems ✓ To identifying and discuses patients stimuli (focal, contextual, and residual) after stroke problem ✓ To help patient identifying in one's own after stroke problem Day 2 Managing the problems after stroke ✓ Discussion after stroke problem on regulator and cognator subsystem ✓ Identifying patient response process on regulator and cognator subsystem Day 3 Introduction: intensive exercise program ✓ Patient perceptual and information processing; To provide information about the intensive exercise program (importance of exercise, motivation to exercise, and whether and how they were doing exercises and what kind of exercises) ✓ The patient learning to provide and help patient identifying the importance of exercise, motivation to exercise, and whether and how they were doing exercises and what kind of exercises) Day 4-6 Patient self learning and judgment process. ✓ Empowerment; order to enable to gain greater control over decisions and actions affecting their health and take an active part in problem solving decision making Day 7 Patient judgment ✓ Patient decision making (following the intensive exercise program by patient self decided based on the patient perceptual and information processing, patient learning, patient judgment) ✓ The digital vital sign, Berg Balance Scale (BBS), Timed Up and Go (TUG), 6-Minute Walk Test (6MWT), Motor Assessment Scale (MAS) ✓ Behavior observed in; physiological-physical, self concept-group identifies, role function, and interdependence mode will measure Short form-36 (SF-36
2nd Week to 5th Week	Patient judgment on the intensive exercise program ✓ The intensive exercise program (3 times a week; day 1,3 and 5); The digital vital sign, will measure regularly before and after exercise Day 7 ✓ Group meeting ✓ Evaluation: The digital vital sign, Berg Balance Scale (BBS), Timed Up and Go (TUG), 6-Minute Walk Test (6MWT), Motor Assessment Scale (MAS)
6th Week	Evaluation ✓ Group meeting/sharing experience; Improve motivation to exercise by nurse and group: the intensive exercise program ✓ Health promotion patients feedback to evaluate patients knowledge and perspective about the intensive exercise program (whether and how they were doing exercises and kind of exercises, importance of exercise) with interview response and interpersonal/group discussion ✓ Evaluation: The digital vital sign, Berg Balance Scale (BBS), Timed Up and Go (TUG), 6-Minute Walk Test (6MWT), Motor Assessment Scale (MAS) ✓ Evaluation in adaptive mode/Behavior observed in; physiological-physical, self concept-group identifies, role function, and interdependence mode will use the SF-36
1st month after health	Maintenance evaluation: ✓ Group meeting/sharing experience; improve motivation to exercise by nurse and group: the

promotion; intensive exercise program	intensive exercise program. ✓ Evaluation: The digital vital sign, Berg Balance Scale (BBS), Timed Up and Go (TUG), 6-Minute Walk Test (6MWT), Motor Assessment Scale (MAS). ✓ Evaluation in adaptive mode/Behavior observed in; physiological-physical, self concept-group identifies, role function, and interdependence mode will use the SF-36

Table 2. The Intensive exercise program protocol on post-stroke patients

The intensive exercise program (Langhammer, Stanghelle, & Lindmark 2009)	
Frequency	3 times a week
Intensity	Endurance: 70–80%, calculated from maximal pulse Strength: 50–60% calculated from 1RM
Time	40–60minutes
Type	✓ Endurance exercises: walking, treadmill,Working with balls or ballons ✓ Strength exercises: 10 repetitions in 3 sets ✓ Extension of back: pulley, pull-down, ‘‘walking stick,’’ prone-extension. ✓ Stomach: ordinary sit-ups with fixation of pelvis if necessary ✓ Arms: push-ups in chair, weight–lifting, water bottles, pulley ✓ Hips-legs: ordinary knee flexion/ extension, walking-stairs, steps ✓ Legs-feet: toe-and heel rise on the floor, step, Airex mat, with or without support ✓ Balance: walking on even/uneven surface, walking in 8, keeping borders , walking on a line, dual task, obstacles, dancing, tai-chi If not possible with any of the above: sitting: senior dance, balls, balloons Do light stretching of large muscles at the end NOTE: the intensive exercise program (intensity, time and type) following patients regulator coping process/ability increasing step-by step

Table 3. Instruments

Behavior	Instruments	Time measures
Physiological-physical	The digital vital sign	Before and after exercise (regularly)
	Berg Balance Scale (BBS) Timed Up and Go (TUG) 6-Minute Walk Test (6MWT) Motor Assessment Scale (MAS)	Before and after exercise Day 7 day every week 1st month after health promotion and exercise
Physiological-physical, role function, self-concept, and interdependence mode	Short form-36 (SF-36)	Before health promotion; exercise (T1), after health promotion;exercise (T2), and 1st month after health promotion;exercise (T3)

The Motor Assessment Scale (MAS) is a test of motor function, each item scores from 0 (no function) to 6 (normal function), the total scores of the eight items range between 0 and 48 (Carr et al., 1985). The BBS, TUG and MAS has been tested for reliability and validity with good results (Finch et al., 2002).

The 6-Minute Walk Test (6MWT), patients will be instructed to walk 30 m between 2-floor marks, and after passing either mark, they will be instructed to turn and walk back as far as possible during a period of 6 min (Butland et al., 1982; Flansbjer et al., 2008). 6MWT has been tested in several stroke studies with satisfactory results (Pohl et al., 2002).

The short-form-36 (SF-36) consists of 36 items representing eight generic health concepts: physical functioning (PF), role disability due to physical health problems (RP); bodily pain (BP); vitality (energy/fatigue) (VT); general health perceptions (GH);

social functioning (SF); role disability due to emotional problems (RE); and general mental health (MH). These studies that examined the reliability of the SF-36 have exceeded 0.80 (McHorney et al., 1994; Ware et al., 1993). An individual adaptive claim based on the vital sign in a normal range/tolerance vital sign, improve grip strength, muscle tone, walking capacity, balance, and quality of life, decrease Timed Up and Go (TUG), increasing confidence and belief on exercise time by time, based on instruments score.

The overall adaptive on the group will use the score of the Berg Balance Scale (BBS), Timed Up and Go (TUG), 6-Minute Walk Test (6MWT), Motor Assessment Scale (MAS) and the SF-36 within groups; pre and post health promotion; intensive exercise program post-stroke. The outcomes score will records on outcomes score form record (table.4). The repeated measures ANOVA will use as statistic analysis in order to know the effectiviness of the exercise.

Table 4. The outcomes score form record

Week/day		TEST/MEASURES/SCORE							
		Vital sign			BBS	TUG	6MWT	MAS	SF-36
		BP	P	RR					
1st	day 1	√	√	√					
	day 3	√	√	√					
	day 5	√	√	√					
	day 7	√	√	√	√	√	√	√	√
2nd	day 1	√	√	√					
	day 3	√	√	√					
	day 5	√	√	√					
	day 7	√	√	√	√	√	√	√	
3rd	day 1	√	√	√					
	day 3	√	√	√					
	day 5	√	√	√					
	day 7	√	√	√	√	√	√	√	
4th	day 1	√	√	√					
	day 3	√	√	√					
	day 5	√	√	√					
	day 7	√	√	√	√	√	√	√	
5th	day 1	√	√	√					
	day 3	√	√	√					
	day 5	√	√	√					
	day 7	√	√	√	√	√	√	√	
6th	day 7	√	√	√	√	√	√	√	√
1st follow-up		√	√	√	√	√	√	√	√

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