

Middle Range Theory: Process of Adaptation to the Gestational Weight Gain

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Received: October 20, 2017; Published: December 11, 2017

Abstract

The construction of the middle range theory is presented: Adaptation to the Gestational Weight Gain Process (APAPG), which explains the interaction of environmental stimuli (stressful events), the coping mechanisms and adaptation responses that influence the attainment of a healthy weight gain during pregnancy. For the construction of the middle range theory we used the three steps of Fawcett's theoretical derivation method, we illustrate the links between the concepts of Roy's theory, the concepts of the APAPG mid-range theory and the empirical indicators. The APAPG theory provides support for research and practice in the area of women's health as well as to increase the body of knowledge in nursing science.

Keywords: Stressful Events; Psychological Adaptation; Eating Behavior

Introduction

Overweight and obesity in women of childbearing age is a worldwide public health problem, it is estimated that 40% of all overweight adults are women and 15% of them are obese [1]. This problem can start or increase during pregnancy [2], it has been identified that more than half of pregnant women gain more than their recommended weight and retain more than 5 kg of postpartum weight [3]. In addition, overweight and obesity is associated with multiple maternal complications during pregnancy, including preeclampsia, gestational diabetes, and miscarriage, excessive loss of blood at birth, wound infections, and maternal death [4,5]; in addition, maternal obesity increases the risk of adverse fetal outcomes; such as macrosomia, congenital anomalies, prematurity and fetal death [6,7]. As well as increasing the risk of obesity in offspring [2].

Results of systematic reviews and meta-analyzes have identified that interventions for weight control during pregnancy have focused on changing habits related to diet and physical activity, but these have had limited efficacy [8-10]. Given the magnitude and extent of the problems associated with excessive gestational weight gain, new study approaches are needed to explain why pregnant women find it difficult to achieve weight gain in line with international health recommendations.

Understanding the adaptive responses of the person to prevent aspects related to obesity is consistent with the health prevention approach of the nursing discipline [11]. The purpose of this paper is to describe the construction of the APAPG middle range theory using Fawcett's theoretical derivation method.

Development of the Middle Range Theory

Theories are a practical guide for the explanation and understanding of the phenomena of study, however their concepts are very general and somewhat abstract, the theory of middle range allows to study the phenomenon in a more specific form, through a limited

number of concepts that, although abstract, are closer to being observed and incorporated into propositions and hypotheses that can be examined empirically, their main function is to guide empirical research using scientific research [11].

Fawcett J (2005) proposes three derivation steps for the theoretical-empirical conceptual construction of a middle range theory and are the ones guiding this work [12]:

- 1) Review of the literature: consists of the search and critical review of the literature on the subject or practical situation of research. It facilitates the identification of the conceptual model or models that have been useful to explain the phenomenon of study as well as the variables that have been associated with it.
- 2) Description of the conceptual model and guidelines for its application to research: This step describes the substantive content of the selected conceptual model (concepts, non-relational and relational propositions linking two or more concepts) and the guidelines for applying the model to the investigation. The purpose is to understand the content and its application in research in the particular phenomenon of study.
- 3) Construction of an empirical theoretical conceptual structure: This step consists of the construction of an empirical theoretical conceptual structure (CTE) for a proposed study. The components of the CTE structure are the conceptual model (C) which is the basis for the research topic or practical situation, the theory (T) to be generated or tested, and the empirical indicators (E) that provide a form to directly observe the theory. Next, the development of each of them is presented.

The starting point for the development of middle range theories is to analyze and synthesize theoretical and empirical knowledge about the study phenomenon (gestational weight gain). This work reviewed the theories or models that have been used to study gestational weight gain, and empirical studies on concepts that influence weight gain during pregnancy. A systematic review of theoretical literature revealed that in a 22-year period from 1990 - 2012, the most commonly used conceptual models for examining obesity/weight-control behaviors come from non-nursing disciplines [13]. From the models in the field of nursing, it was identified that Roy's adaptation model [14] has been used to study pregnant women [15], but no specific studies with the concept of gestational weight gain with this model were identified. A review of philosophical assumptions and model concepts allowed the decision to use Roy's theory of adaptation as a conceptual model to derive the theory of mid-range gestational weight gain was selected because the model includes all concepts of Meta paradigm and its holistic adaptation approach, which is congruent with the phenomenon of interest.

Analysis of The Roy Adaptation Model

The Roy Adaptation Theory is born from von Bertalanffy's general systems theory [16] and Helson's theory of adaptive level [17]. Roy proposes as nursing goals to promote the adaptation of individuals and groups in the four adaptive modes, thus contributing to health, quality of life and dying with dignity by assessing behavior and factors that influence adaptive capacities and strengthen environmental interactions.

The Roy Adaptation Theory describes four central concepts: a) stimuli, b) coping processes, c) modes of adaptation, and d) adaptive responses. Roy describes the person as a human adaptive system, which possesses thinking ability and feelings etched in consciousness that help him to adjust effectively to changes in the environment. The environment for Roy, are all the conditions, circumstances and influences that surround and affect the development and behavior of the person. These conditions identify them as stimuli. A stimulus defines it as the one that elicits a response. Roy describes three types of stimuli: Focal, contextual, and residual. The focal stimulus is represented by the object or event that is present in the person's consciousness and focuses all his energy on trying to face it.

Contextual stimuli are those that, while not the center of attention or energy consumption, influence how people can cope with focal stimuli.

The stimuli activate the coping processes of the human adaptive system, with the purpose of triggering responses that allow the person to control the situation, these processes are categorized as a regulatory and cognitive subsystem, the subsystem of regulatory coping mediated by the autonomic nervous system and endocrine system responds automatically and unconsciously producing physiological responses.

The cognitive coping subsystem is framed in consciousness and is related to the cognitive and emotional processes that allow the person to interpret the situation and deal with environmental stimuli, encompassing four cognitive-emotional channels for the processing of stimuli: perceptual/processing of information, learning, judgment, and emotion.

For Roy the adaptive system responses of the individual also called behaviors represent actions and reactions under specific circumstances. The behaviors are observed through the four modes of adaptation: Physiological mode shows the physical and chemical processes involved in the function and activities of living organisms [18]. The five basic needs for physiological integrity identified in this mode are: 1) oxygenation; 2) nutrition; 3) elimination; 4) activity and rest, and 5) protection.

The adaptation to the Roy model is the result of the response to the stimulus that arises in relation to the level of adaptation, the model describes three levels of adaptation: Integrated, compensatory and compromised. The level of integrated adaptation is when the individual has managed to maintain the structure and function of their vital processes to meet their human needs. At the level of compensatory adaptation, the regulatory and cognitive mechanisms are activated as a challenge of the integrated processes to look for adaptive responses, trying to reestablish the organization of the system. The compromised level of adaptation occurs when the responses of the mentioned mechanisms are inadequate; therefore, it is an adaptation problem.

Middle Range Theory: Process of Adaptation to Gestational Weight Gain

The APAPG middle range theory was deduced from the assumptions and concepts of Roy Adaptation Theory [18] and research on the literature related to gestational weight gain. This theory proposes that focal and contextual stimuli are predictors of coping processes and coping processes are predictors of gestational weight gain (adaptation response) when contextual and focal stimuli factors are inter-related. Contextual stimuli affect the focal and at certain moments can become focal.

In this case, the focal stimulus is represented by the pregnancy, for some women it is a happy and cheerful period, however it can generate an over demand, associated with the changes related to this reproductive period, if the social context in which it takes place pregnancy is not optimal, can lead to high levels of stress for pregnant women [19,20].

The contextual stimulus is represented by the conditions or situations in which the pregnant woman is immersed and can cause her concern such as marital status, socioeconomic status, occupation, BMI prior to pregnancy, number of children, hours of sleep and perceived stress. Stress is considered as a process that starts when a person perceives a situation or event as threatening or overflowing with their resources [21]. When the body cope with stress, the person's coping mechanisms are activated to regulate the endocrine processes, manifesting through the release of cortisol [22]. Cortisol generates a biological response through a coordinated network of neuroendocrine signals that influence appetite, food behavior, energy balance and fat distribution that allow it to interpret the situation and deal with environmental stimuli [23-25].

Through the review of the literature it has been found that pregnant women who are younger, have a lower socioeconomic level, more children, have a pre-gestational body mass index in overweight or obesity and consume unhealthy foods have are more likely to gain weight during pregnancy than those who do not have these characteristics [26-31]. In addition, women with obesity during pregnancy tend to have higher levels of cortisol and gain more weight than women with normal weight. Cortisol levels predict dietary intake and consumption of carbohydrate-rich foods [32,33]. In addition, low-income pregnant women report higher levels of stress and show lower quality of dietary intake during the first trimester of pregnancy [34].

The coping process is represented by the cognitive function psychological adaptation which describes the processes used by the pregnant woman to cope with stressful situations. Psychological adaptation includes the processes of focusing on problem solving, negative self-targeting, positive re-evaluation, open emotional expression, avoidance, seeking social support, and religion.

Coping strategies have been identified as moderators of the association between stressors and health outcomes [35], it has been found that women with normal weight use to a greater degree confrontational coping strategies than those who were obese and with overweight [36]. On the other hand, avoidant coping is associated with adverse outcomes in maternal mental health as well as with increased perception of stress [37]; however, some coping strategies have been linked to indicators of maternal psychological well-being such as positive assessment or faith [19].

Adaptive responses to achieve a healthy weight gain are represented through the physiological mode with eating behavior, this refers to the feeding routines performed by the woman during pregnancy, including the type, quantity and quality of the food she consumes, levels of perception of hunger, satiety and cravings for food. Also some beliefs that have in relation to the feeding during the pregnancy, for example exist the belief that a pregnant woman is hungrier than normal because it must eat by two people, that during the pregnancy it is normal to have certain desires or cravings for food that did not have before it, and that at this stage naps during the day are necessary to feed or nourish their babies [38].

In non-pregnant women with high levels of cortisol (physiological stress), they have been found to be more reactive to eating snacks in response to daily stress factors [39]. People with high BMI show a strong association between chronic stress and weight gain [40] and in line with this idea; stress is significantly associated with OB in women [41].

Assumptions of the theory of maternal stress and gestational weight gain

Propositions are statements that describe the relationship between the concepts of a theory; as such, they accommodate a wide range of hypotheses to be empirically tested. The propositions for an APAPG middle range theory are:

Focal stimuli (indicated by the trimester of pregnancy) and contextual stimuli (indicated by marital status, socioeconomic status, occupation, pre-pregnancy BMI, number of children, hours of sleep and perceived stress) act directly on the coping processes (indicated by psychological adaptation) as the two stimuli factors are related, whether the contextual stimuli directly affect the focal stimuli or that focal and contextual stimuli are correlated. In addition, it is postulated that the coping processes impact on healthy gestational weight gain, the latter indicated by the physiological mode (type, quantity and quality of food consumed, levels of perception of hunger, satiety and cravings for food).

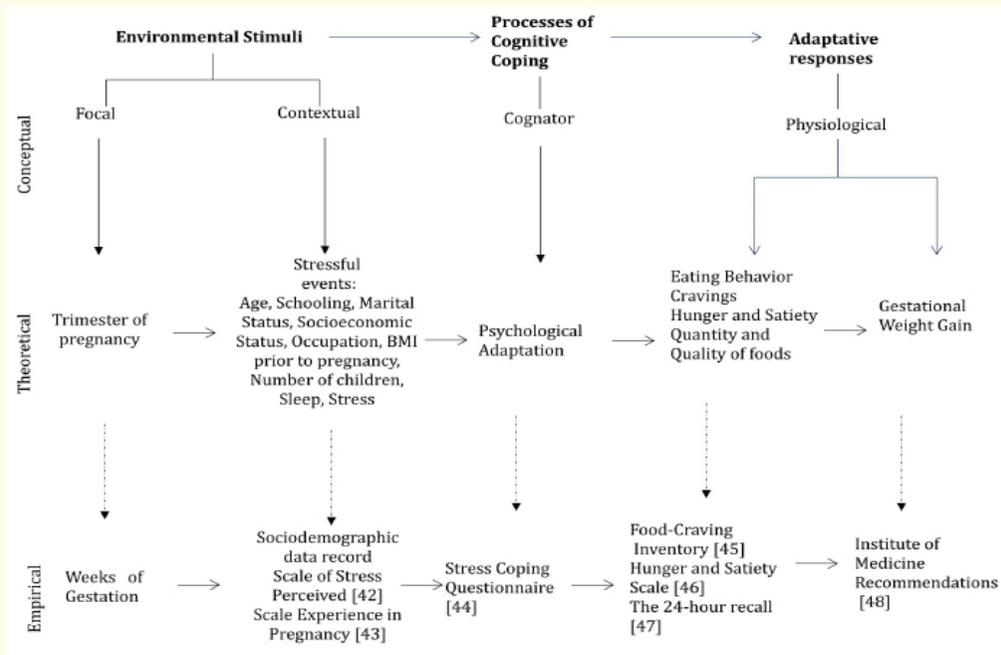


Figure 1: Conceptual-Theoretical-Empirical Structure.

Conclusions and Implications

The Roy Adaptation Theory is considered appropriate to generate the theory of mid-range gestational weight gain. Through which health professionals can improve weight gain in pregnancy, if evaluated and treated the general situations and specific factors that generate stress for pregnant women. Understanding the factors that contribute to excess gestational weight gain supports the design of interventions to prevent excessive weight gain during pregnancy and thus help in the fight against the epidemic of obesity when intervening at a point in life when the risk of overweight and obesity is increased.

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Volume 12 Issue 2 December 2017

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