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Longitudinal testing of a dietary self-care motivational model in adolescents with diabetes

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ABSTRACT

Objective: Based on self-determination theory, this study tests a model positing that perceived autonomy support from parents and health care providers positively predicts self-efficacy and autonomous self-regulation in dietary self-care. In turn, self-efficacy and autonomous self-regulation predict better dietary self-care over time.
Method: Longitudinal data were collected in a consecutive series of 289 adolescent patients with type I diabetes at two time points separated by a two-year interval.
Results: Structural equation modeling analysis revealed that perceived autonomy support from health care providers at Time 1 (T1) positively predicted self-efficacy and autonomous self-regulation at Time 2 (T2), T1 self-efficacy and autonomous self-regulation positively predicted T2 dietary self-care, and T1 dietary self-care positively predicted T2 autonomous self-regulation.
Conclusion: Autonomy support from health care providers appears to help adolescents develop motivational factors for dietary self-care and adhere to dietary recommendations.

Introduction

Dietary self-care is associated with blood glucose control, which is central to type I diabetes treatment and prognosis [1]. However, following a well-balanced diet combined with adequate insulin intake to maintain strict control of blood glucose can be daunting for young patients. The data show that self-care is particularly problematic for adolescents: fewer than 50% manage to follow dietary recommendations [2]. Autonomous self-regulation and perceived self-efficacy have recently emerged as key variables in dietary self-care [3–6]. According to organismic integration theory, a sub-theory of self-determination theory (SDT) [7], when supported and nurtured by others, these motivational factors enable the internalization of healthy behaviors that are not initially valued or interesting [8]. Growing evidence supports this proposal. For instance, adolescents in conflict with significant others have greater problems with self-care [9] compared to those who perceive that their problems are approached with warmth and empathy [9,10]. However, the psychological processes underlying these relationships remain unclear. This study aims to shed light on the mechanisms by which motivational factors for dietary self-care are facilitated in adolescents with diabetes. Based on SDT, longitudinal relationships between environmental and motivational factors for dietary self-care are examined.

Self-determination theory: Motivational factors and consequences

SDT is a macro-theory of human motivation that emphasizes choice and volition in behavior initiation, as opposed to a sense of being controlled, manipulated, or coerced [8]. Rather than a unidimensional focus on motivation quantity, SDT defines distinct motivation types: autonomous self-regulation (doing something for its own sake), controlled regulation (doing something for an instrumental reason), and amotivation (doing something without intent) [11]. These different regulations are largely determined by the degree to which an environment allows one to experience volition: the more an activity is chosen freely and accepted as one's own, the more it is internalized, congruent with the self, and likely to endure over time. Research shows that autonomous motives relate to long-term adoption of health behaviors, including exercise persistence [12], eating regulation [13], smoking cessation [14], medication adherence [15], and treatment retention [16,17]. Accordingly, studies in adolescents [3] and adults [5,18,19] show that patients with diabetes who follow dietary recommendations under autonomous self-regulation maintain better self-care and metabolic control. Moreover, with respect to autonomous self-regulation, SDT proposes that individuals must perceive that they are capable of achieving what is expected from them. This enables them to take initiative and voluntarily pursue

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required action such as dietary self-care [7]. Studies in adult patients concur that perceived competence and self-efficacy are strong predictors of dietary behaviors [5,20–22]. Albeit not identical, these concepts share similarities, including the capacity to act [23]: because perceived self-efficacy is sensitive to environmental changes, and is socially acquired, it is typically more task- and situation-specific than perceived competence, which is more general in nature, in that it springs from an innate desire to master skills [24,25]. In the literature, patients' confidence in their ability to follow dietary recommendations – a specific diabetes management method – usually indicates perceived self-efficacy [20]. This perception can be assessed in terms of barriers such as temptation, negative mood, and uncontrollable situations [20,26].

Much of the research on the consequences of autonomous self-regulation and self-efficacy has shown that motivational factors have additive effects on adaptive outcomes [27,28]. However, SDT [29] proposes that past experience of autonomy can facilitate subsequent perception of autonomous self-regulation. Similarly, social learning theory [30], from which the concept of self-efficacy derives, posits that past accomplishments are predictive of future self-efficacy perception. Although both motivational factors feature frequently in behavioral change models, they are typically conceived as mutually covariant or as having unidirectional effects on an outcome. A closer examination of potentially reciprocal relationships between these variables and dietary self-care is therefore needed.

The role of significant others on motivational factors for dietary self-care

SDT posits that motivational factors can be stimulated by an environment that is autonomy-supportive rather than controlling. Autonomy-supportive environments provide choice, positive feedback, and a meaningful rationale for action, whereas controlling environments involve pressure or coercive measures to motivate behavior [31]. In pediatric settings, the supportive role of health care providers has long been recognized as essential for diabetes care [32–36]. However, little is known about the extent to which pediatricians, nurses, and nutritionists are autonomy supportive with adolescents. To date, autonomy support from health care providers has largely been documented in adults with diabetes [5,18,19,21,37].

Results show that the more patients are supported by providers, the more they feel effective and autonomously self-regulated toward self-care [5,19]. Among the few studies that have focused on supporting behaviors similar to autonomy support, the DAWN youth study [38] suggests that adolescents should be offered choices and nonjudgmental advice about their care.

Research also reveals that parental actions that facilitate self-directed care and are aligned with adolescents' wishes foster feelings of effectiveness toward care [33,39,40]. Kyngäs et al. [34] show that adolescents practice good adherence when their parents show interest in them, accept them as they are, and provide positive feedback. In contrast, because diabetes care is an issue on which parents and adolescents often disagree, parent–child conflicts [41] negatively impact self-care [42]. For instance, when parents are perceived as intrusive, controlling, or coercive, self-care tends to be less than optimal [42].

Taken together, these findings suggest that experience with others influences motivational factors for self-care. However, the research is limited by the traditional use of cross-sectional data or a focus on changes over time rather than competing hypotheses about directionality [3,5,21]. Moreover, investigations of the internalization of requested behaviors tend to consider that environmental factors exercise a unidirectional influence on patients [11]. According to social learning theory, individuals with high self-efficacy can reach out and cultivate more supportive relationships [43]. Moreover, studies on delinquency find that unacceptable adolescent behavior negatively affects parents' interpersonal style over time [44,45]. There is therefore a need to advance our understanding of the variables that influence internalization of dietary behaviors over time. Another compelling question is whether autonomy support from different sources, in this case parents and health care providers, is an important dimension to consider for adolescent dietary self-care; in other life domains, positive representations of significant others (e.g., parents, teachers, friends) differentially predict positive outcomes [27,28].

The present study

Using a longitudinal research design with two measurement points (0 and 24 months), we tested a model of dietary self-care internalization based on SDT's organismic integration theory [7], whereby 1) autonomy support from parents and health care providers at Time 1 (T1) positively predicts autonomous self-regulation and self-efficacy perception at Time 2 (T2), and 2) autonomous self-regulation and self-efficacy perception at T1 positively predict dietary self-care at T2. In supplementary models, we tested for the presence of reciprocal and reverse relationships between dietary behaviors, perception of self-efficacy, and autonomous self-regulation in order to determine potential directionality. Longitudinal relationships were examined across gender and diabetes duration, as previous research indicates that these variables are related to dietary self-care [3].

Method

Participants

Participants were recruited from two major pediatric diabetes centers in Québec (Canada). In all, 316 patients were invited to participate, of whom 289 (156 boys) agreed. The main reasons for not participating included lack of time or interest (n=11) and incomplete questionnaires (n=16). Mean age of patients was 14 years (SD=1.5), mean age at diagnosis was 8.2 years (SD=3.7), and mean diabetes duration was 5.6 years (SD=3.8).

Participants were recruited following approval from appropriate institutional review boards. Families were either informed about the study by telephone prior to their appointment or during the visit. Written consent from parents and assent from adolescents was obtained before questionnaire completion. Because visits were scheduled every three months, recruiting lasted one year to ensure that all eligible patients could participate. Eligibility criteria included presence of type I diabetes, age between 11 and 17 years, and ability to read and speak French. All participants were asked to complete a follow-up questionnaire 24 months later.

Measures

Self-efficacy

On a nine-item scale [21], participants rated their confidence in their ability to follow their dietary plan, given common barriers. The barriers included three situations: temptation (e.g., "When someone offers me foods that are high in calories"), negative mood (e.g., "When I feel annoyed or angry"), and uncontrollable situations (e.g., "When I eat at a friend's house"). Items were rated on a ten-point scale ranging from 0 (I am not confident at all that I can follow the dietary plan) to 10 (I am completely confident that I can follow the dietary plan). Internal consistencies for all scales are presented in Table 2.

Autonomous self-regulation

The autonomous self-regulation scale [41] contains 12 statements in response to the question, "Why do you follow your diet?" Three items were used to assess four motivational constructs reflecting varying degrees of internalization of dietary behaviors: intrinsic