Journal of Diabetes and Its Complications 30 (2016) 335–342

Contents lists available at ScienceDirect

Journal of Diabetes and Its Complications

journal homepage: WWW.JDCJOURNAL.COM

Psychosocial factors associated with adherence to non-insulin antidiabetes treatments

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ARTICLE INFO

Article history:
Received 20 July 2015
Received in revised form 8 October 2015
Accepted 21 October 2015
Available online 24 October 2015

Keywords:
Type 2 diabetes
Medication adherence
Psychosocial factors
Non-insulin antidiabetic
Theory of planned behavior
Association of patients

ABSTRACT

Aims: To discern psychosocial factors of non-insulin antidiabetes drug (NIAD) adherence.
Methods: A cross-sectional study based on the theory of planned behavior (TPB). Adults with type 2 diabetes (T2D) who were members of *Diabète Québec*, a provincial association of persons with diabetes, and were prescribed at least one NIAD were invited to complete a web-based questionnaire. We measured variables ascertaining TPB constructs and other factors potentially associated with NIAD adherence (e.g., habit, social support, and mental health). NIAD adherence was assessed using the 8-item Morisky Medication Adherence Scale. Factors were identified using a multivariate logistic regression model.
Results: In our study, 901 participants (373 women; 515 retired; mean age: 62.7 years) with T2D for a mean of 10 years, completed the questionnaire. Participants exhibited a high intention to adhere to their NIAD treatment (mean score = 5.8/6), positive attitudes toward adherence (mean score = 5.5/6), and elevated perceived behavioral control in taking their medication (mean score = 5.7/6). Only 405 (45%) participants reported high adherence (score = 8/8). Perceived behavioral control, habit, older age, no perceived side effects, a longer period since T2D diagnosis and a lower number of NIAD daily doses were significantly associated with adherence ($p < 0.05$).
Conclusion: We identified several factors that may be modified for NIAD adherence and thereby provided insight into future adherence-enhancing intervention targets.

1. Introduction

For many individuals with type 2 diabetes, antidiabetes drugs are necessary to yield optimal glycemic control, which is the main treatment target (Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, 2013). Although several effective and well-tolerated antidiabetes drugs are available that control hyperglycemia and decrease comorbidities associated with this disease (UK Prospective Diabetes Study (UKPDS) Group, 1998), diabetes management is not optimal in many patients (Leiter et al., 2013). In a recently published population-based study on people newly treated for type 2 diabetes in Quebec province, Canada, 38% did not adhere to their antidiabetes treatment during the year following initiation (Guenette, Moisan, Breton, Sirois, & Gregoire, 2013). Such poor adherence is a barrier to reaching clinical targets (Pladevall et al., 2004) and can, therefore, lead to increased diabetes complications and hospitalization (UK Prospective Diabetes Study (UKPDS) Group, 1998; Lau & Nau, 2004). Moreover, poor adherence is likely to be associated with an increase in healthcare costs (Salas, Hughes, Zuluaga, Vardeva, & Lebmeier, 2009).

Interventions to improve medication adherence in type 2 diabetes are thus urgently needed. Community-based associations of patients, such as *Diabète Québec*, reaching and supporting thousands of people with diabetes and their families could leverage and disseminate these interventions through their well-established network. Moreover, they could reach people experiencing unmet needs with the formal healthcare system and contribute to reduce diabetes complications. Intervention planning should first consider the causes of the problem. Previous studies have shown that socio-demographic, medical,

Conflict of interest disclosure: The Chair on Adherence to Treatments was supported by unrestricted grants from AstraZeneca Canada, Merck Canada, Pfizer Canada, Sanofi Canada and the *Prends soin de toi* program (a Quebec provincial program for the improvement of public health). These funding sources had no involvement in the study design, in the collection, analysis and interpretation of data, in the writing of the manuscript and in the decision to submit the manuscript for publication. The authors declare no conflicts of interest relevant to this article.

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http://dx.doi.org/10.1016/j.jdiacomp.2015.10.016
1056-8727/

treatment-related and healthcare-related factors influence adherence to antidiabetes drug treatments (Krass, Schieback, & Dhippayom, 2015). However, many of these factors cannot be modified and are ineffective for planning interventions to improve drug treatment adherence. On the other hand, psychosocial factors that involve both psychological and social aspects are potentially important factors that may be modified and should be considered in designing such interventions (Zwikker, van den Bemt, Vriezekolk, van den Ende, & van Dulmen, 2014). Prior studies have identified psychosocial factors of medication adherence in type 2 diabetes (Farmer, Kinmonth, & Sutton, 2006; Mann, Ponieman, Leventhal, & Halm, 2009; Odegard & Capoccia, 2007; Park et al., 2010; Zwikker et al., 2014), but, to our knowledge, only a few studies have used a psychosocial theoretical model (Farmer et al., 2006; Mann et al., 2009; Mayberry & Osborn, 2014; Park et al., 2010). These models help identify factors influencing behaviour adoption and better our understanding of intervention targets (Bartholomew, Parcel, Kok, Gottlieb, & Fernandez, 2010).

The theory of planned behavior (TPB) is one of the most effective theories for predicting health-related behaviors (Armitage & Conner, 2001), however few studies have used it in the context of medication adherence in type 2 diabetes. Using the TPB, Farmer et al. (Farmer et al., 2006) observed that two beliefs were associated with reduced medication adherence among people (n = 121) with type 2 diabetes in the United Kingdom: changes in daily routine enhances difficulty with taking antidiabetes medications regularly and antidiabetes medications lead to weight gain. Because this study was exploratory, i.e., the authors only identified beliefs associated with adherence in a small population, we performed a study using the TPB to identify psychosocial factors associated with adherence to non-insulin antidiabetes drugs (NIAD) among people with type 2 diabetes in Quebec, Canada. As members of community-based patients' associations are rarely studied and as these associations constitute a novel way to disseminate interventions, we performed the study among members of *Diabète Québec* already using NIAD.

2. Subjects, materials and methods

2.1. Theoretical model guiding the study

To ease the thorough identification of psychosocial factors associated with NIAD adherence we used a rigorous methodology based on the TPB. As suggested by the developers, NIAD adherence was defined in terms of its action, target, context, and time (Ajzen, 1991): "to take (action) all my non-insulin antidiabetes drugs (target) exactly as prescribed (context) over the next month (time)". According to the TPB principles, adopting a health-related behavior such as medication adherence is directly determined by the intention to adopt the behavior and by perceived behavioral control, i.e., the patient's perceptions of his/her ability to adhere (Ajzen & Fishbein, 1980). In addition, an intention to adopt a health-related behavior is predicted by three factors. In the case of adherence: 1) the patient's attitude toward medication adherence (i.e., the degree to which the patient values adherence positively or negatively), 2) subjective norms (i.e., a perceived social pressure to adhere or not to the medication regime), and 3) perceived behavioral control (i.e., a perceived ability to adhere to the medication regime). Attitude, subjective norms and perceived behavioral control are, respectively, determined by patient's beliefs: 1) behavioral beliefs (i.e., the perceived advantages/disadvantages of adherence), 2) normative beliefs (i.e., the perceived expectations of significant others, e.g., a person's spouse, family, friends, and doctor) and 3) control beliefs (i.e., the perceived factors that can impede or facilitate adherence to a medication regime). Studies suggest that add other variables to the TPB may improve health-related behavior predictions (Alison Phillips, Leventhal, & Leventhal, 2013; Armitage & Conner, 2001). In consequence, for the model presented in Fig. 1, we added habit, socio-demographic, clinical, diabetes and medication-related variables (in gray in Fig. 1) to the TPB.

2.2. Study design and participants

We performed a cross-sectional study using a sample of individuals with type 2 diabetes. The study participants were all members of *Diabète Québec*, which is a provincial patients' association that provides services and diabetes education and advocates for patients suffering from diabetes. For eligibility, individuals must be 18 years old or over, report a diagnosis of type 2 diabetes and have been prescribed at least one non-insulin antidiabetes drug.

2.3. Procedure and data collection

Diabète Québec searched their members' database for adults with type 2 diabetes and an email address; those members were sent an email invitation to participate to the study. This email included information on the study and an electronic consent form. Consenting individuals were asked to complete a web-based questionnaire. Individuals could enter information into the questionnaire through a private secured link provided by the research team upon receipt of their electronic consent signature. Because non-eligible individuals could have been invited, inclusion and exclusion criteria were reverified at the beginning of the questionnaire so that only eligible participants could complete the study. *Diabète Québec* sent a reminder email within 8 days following the initial invitation to all people who were initially screened. Once the participants completed the questionnaire, their responses were electronically transmitted to the research team. The questionnaires were completed from December 2012 to February 2013.

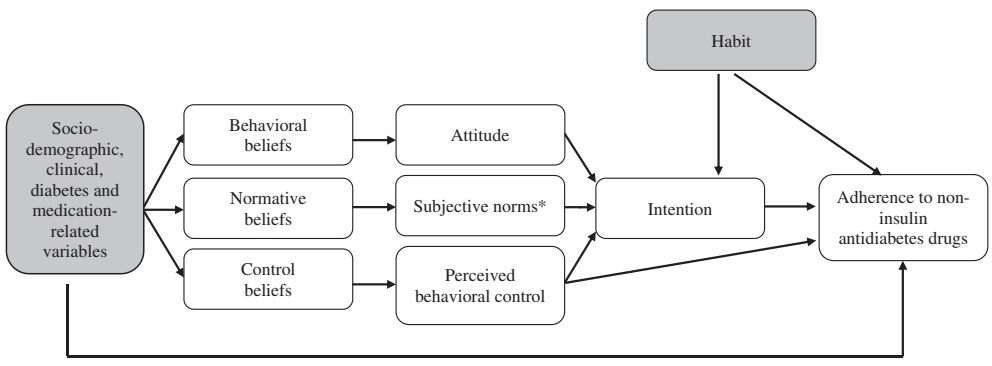

Fig. 1. Theoretical framework based on the theory of planned behavior. Legend: Gray = additional variables. *Subjective norms was removed from the model after the validation study.