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The relationship between the theory of planned behavior and medication adherence in patients with epilepsy

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ABSTRACT

Purpose: The aim of this study was to apply the theory of planned behavior (TPB) with two other factors (action planning and coping planning) to the medication adherence of adults with epilepsy.
Methods: We measured the elements of the theory of planned behavior (attitude, subjective norm, perceived behavioral control, and behavioral intention), action planning, and coping planning at baseline among adults with epilepsy (n = 567, mean ± SD age = 38.37 ± 6.71 years, male = 48.5%). Medication adherence was measured using the Medication Adherence Report Scale (MARS) and antiepileptic serum level at the 24-month follow-up. Structural equation modeling (SEM) examined three models relating TPB elements to medication adherence.
Results: Three SEM models all had satisfactory fit indices. Moreover, attitude, subjective norms, perceived behavioral control, and intention together explained more than 50% of the variance for medication adherence measured using MARS. The explained variance increased to 61.8% when coping planning and action planning were included in the model, with coping planning having greater association than action planning. In addition, MARS explained 3 to 5% of the objective serum level.
Conclusion: The theory of planned behavior is useful in understanding medication adherence in adults with epilepsy, and future interventions may benefit by improving such beliefs as well as beliefs about coping planning.

1. Introduction

The prevalence of epilepsy is high among the neurological disorders [1,2], with 4 to 10 in every 1000 people worldwide and 18 in every 1000 people in Iran diagnosed with the disorder. The issue of epilepsy is particularly important in developing countries as the incidence rates of epilepsy (~100 to 190 per 100,000 person-years) are higher than those in industrialized countries (~40 to 70 per 100,000 person-years) [2].

Fortunately, epileptic seizures can be controlled using antiepileptic drugs (AEDs): nearly 60% of patients with epilepsy can have seizures fully controlled by taking prescribed medication [3]. However, medication nonadherence among patients with epilepsy is between 30 and 50% [4–6], and nonadherence results in treatment failure [7]. Studies that use continuous objective measures of adherence also show high rates of nonadherence, with less than half of patients taking one-third or fewer of the prescribed AED doses [8], and only 76% of doses are taken overall [9]. In addition to reducing control over epileptic seizures, poor adherence affects other important health-related outcomes, including number of hospital admissions, inpatient treatment days, and emergency room visits; healthcare costs [10,11]; and subjective quality of life [12]. Therefore, improving medication adherence is a critical issue for clinicians caring for patients with epilepsy.

As medication adherence is a behavioral issue, we hypothesized that the theory of planned behavior could provide insight into factors that reduce adherence. The theory of planned behavior was proposed by Ajzen [13], and it provides a theoretical framework for researchers to systematically understand the factors that affect behavioral change. The theory posits that three key elements (attitude, subjective norm, perceived behavioral control) predict a person's intent to engage in a behavior such as medication adherence, and behavioral intention, in turn, predicts behavior. Ajzen [13] defines attitude as a person's positive or negative evaluation of performing the behavior, subjective norm as the perception that other important people approve or disapprove of the behavior, and perceived behavioral control as a person's views on his or her capability to do the behavior. Moreover, perceived behavioral control is thought to predict not only intentions but also directly predict behavior [14]. As prior research supports the use of the theory of planned behavior in predicting intention and behavior across different populations and behavioral domains [15–17], we propose that the

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theory could also help explain medication adherence among patients with epilepsy.

In addition to the theory of planned behavior, some studies suggest that two other factors (action planning and coping planning) predict people's intentional behavior [18,19]. Action planning refers to specifying the when, where, and how of engaging in a particular behavior, and once a person has established an intention to engage in a behavior, action planning is thought to help translate the intention into behavior [20]. Coping planning refers to anticipating barriers that might come in the way of enacting a behavior [21]. For example, when patients utilize coping planning for medication adherence, they consider barriers that might prevent them from taking medication as well as ways to overcome those barriers. Moreover, action planning and coping planning should each mediate the association of intentions on behavior [22,23]. Therefore, the theory of planned behavior, as well as a revision that adds action planning and coping planning, has been shown to predict adherence to healthy behavior [24].

In the present study, we explored the factors that associate with medication adherence in adult patients with epilepsy. In order to assess the causal effects of intention on medication adherence, we used a 24-month follow-up of adherence behavior. Based on the theory of planned behavior and the literature on action and coping planning, we proposed three models to explain the medication adherence. The first model (Model 1, see Fig. 1) is the simplest model, which only adopted the theory of planned behavior. The behavior measured in Model 1 is self-report medication adherence, and we hypothesized that attitude, subjective norm, and perceived behavioral control would associate with self-reported medication adherence through behavioral intention. In addition, perceived behavioral control would also directly associate with self-reported medication adherence. The second model (Model 2, see Fig. 2) added one index of objectively measured AED serum level in Model 1. As prior research shows self-reported adherence to be associated with objective measures of adherence [25,26], we examined the extent to which theoretical factors predicted both self-reported and objectively measured adherence. The third model (Model 3, see Fig. 3) added action planning and coping planning to Model 2. In addition to the above hypotheses, Model 3 also hypothesized that behavioral intention would affect medication adherence through action planning and coping planning and that perceived behavioral control would relate to medication adherence through action planning and coping planning.

2. Methods

2.1. Participants and procedures

The study was performed in five neurologic clinics in Tehran and Qazvin from February 2012 through July 2015. The ethics committee of Qazvin University of Medical Sciences approved the study prior to participant recruitment.

Patients with epilepsy were invited to participate in this study if they a) were 18 years old or older, b) were responsible for taking their own medication, and c) were prescribed AEDs. Patients were excluded from the study if they a) did not agree to complete informed consent, b) had intellectual disability, or c) had a progressive medical or neurological disorder. The participants who agreed to participate first signed a written informed consent and a background information sheet. Participants then completed the questionnaire for theory of planned behavior. At a 24-month follow-up, participants filled out the MARS and had their serum level measured. The reason for measuring MARS and serum level at a 24-month follow-up is based on the nature of the theory of planned behavior. The theory of planned behavior claims that an individual performs a given behavior depending on a combination of particular individual and social factors, while the presence or absence of these factors can predict a person's future behavior. Therefore, we need longitudinal evidence when using the theory of planned behavior. Baseline behavior is considered as past behavior that cannot be viewed as future behavior. Moreover, according to the recommendations from the developer, Ajzen, of the theory of planned behavior, past behavior may not be a good predictor for future behavior because the past behavior would represent as a habit [27]. As a result, this study was designed prospectively to assess the behavior of medication adherence at a 24-month follow-up.

2.2. Instruments

The methods of data collection were questionnaires and a blood assay. All questionnaires were written in Persian for the Iranian population.

2.2.1. Medication Adherence Report Scale (MARS)

The MARS is a self-report questionnaire for medication adherence. We used the brief version of MARS, which contains five items each

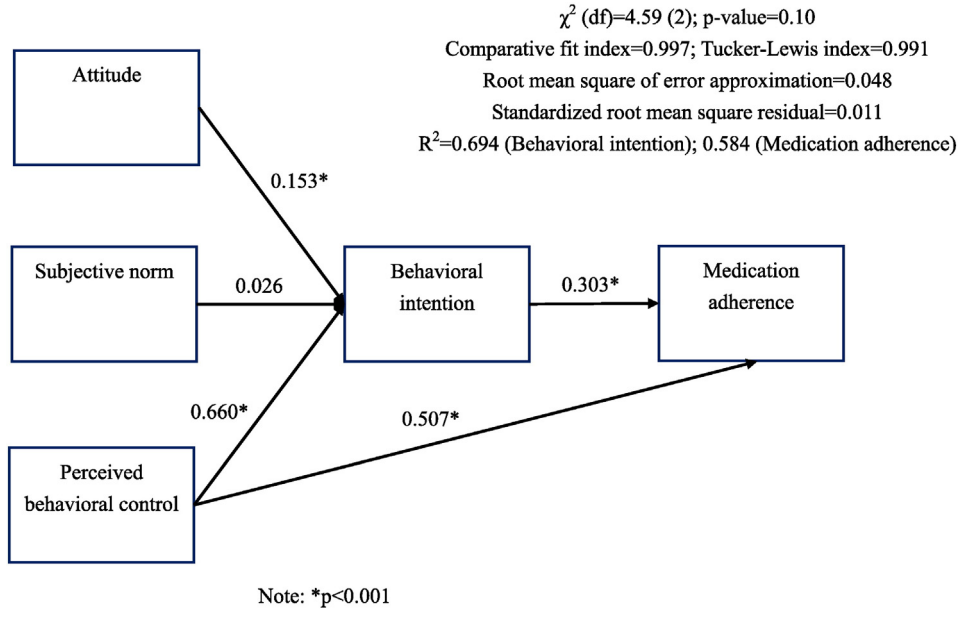

Fig. 1. Model 1: Medication adherence model.