European Geriatric Medicine 8 (2017) 325–329

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Research paper

Construct validity of Attitudes Towards Vaccinations Scale (ATVS)–part 2

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ARTICLE INFO

Article history:
Received 24 April 2017
Accepted 20 June 2017
Available online 22 July 2017

Keywords:
Vaccination
Older adults
Scale validation
Health-related
Behaviour
Anxiety

ABSTRACT

Understanding patients' motives for or against taking vaccination can enhance effectivity of doctors' efforts to motivate their older patients to the advantageous health choices. We developed a tool Attitudes Towards Vaccination Scale (ATVS) assessing senior's attitudes towards vaccination uptake. In this article we demonstrate the relationship between constructs measured by the scale and five well-established psychological concepts, such as anxiety, locus of control, level of self-efficacy, health-related behaviours and styles of coping with stress.

Method: The validation was performed on a sample of individuals aged 60 and more recruited in rural and urban outpatient services ($n = 85$). We assessed divergent and convergent aspects of construct validity by correlating the ATVS Positive Attitude subscale (PA-subscale) and Negative Attitude subscale (NA-subscale) with other psychometric tools, such as State and Trait Anxiety Inventory (STAI), Multidimensional Health Locus of Control Scale (MHLC), Generalized Self-Efficacy Scale (GSES), Inventory of Health-Related Behaviours (IHRB), Coping Inventory for Stressful Situations (CISS). We estimated also known group differences.

Results: The PA-subscale correlated positively with all subscales of HRBI, task-oriented style of coping, and internal locus of health control. The NA-subscale correlated negatively with task-oriented style of copying, generalized self-efficacy and internalized locus of control, while positively with anxiety the trait, external locus of health control (based on chance) and the emotion-oriented style of coping.

Conclusions: The results of the study confirmed the construct validity of the ATVS. We believe our tool may be used in a clinical practice to apply more appropriate strategies to encourage older patients to take vaccines.

1. Introduction

Vaccination is one of the greatest medical inventions allowing to save millions of lives. Despite the strong evidence that it protects people against infectious diseases, its use is still low among older people. This is due to different reasons, i.e. high costs, poor knowledge, low motivation and negative previous experiences [1–3]. Since vaccination is not obligatory for older adults in most countries, the positive attitude grounded on knowledge and individual experience appear to be the crucial factor enhancing the vaccination rate in this age group. Therefore, we developed the Attitudes Towards Vaccinations Scale (ATVS), which consists of the Positive Attitudes subscale (PA-subscale) and the Negative Attitudes subscale (NA-subscale) to assist clinicians in assessing the attitudes of their older patients [4]. Each of the subscale contains four items rated on a five point Likert scale (Table 1). We believe that, by indicating the need of diversifying approaches in patient's education about immunization, the ATVS may be conductive to altering doctors' approach towards more effectively motivating their patients to take vaccines. The aim of the validation study was to test the construct validity and known group validity of the newly developed scale. By confronting the ATVS with other tools, we demonstrate its theoretical background.

2. Methods

2.1. Setting and sample

The study was carried out in autumn 2013. The sample consisted of 85 patients aged 60 and more (M = 70.1; SD 7.5), out of whom 45 were recruited in a family doctor's outpatient clinic in a

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http://dx.doi.org/10.1016/j.eurger.2017.06.008
1878-7649/

Table 1
List of the items constituting the ATVS subscales.

Positive attitude subscale (PA-subscale)
In your opinion, should a person aged 60 or more undergo vaccination?
In your opinion, when undergoing vaccination, do we protect others against diseases?
In your opinion, does vaccination reduce the risk of late consequences of disease?
In your opinion, should one take vaccines since it is recommended by doctors?
Negative attitude subscale (NA-subscale)
In your opinion, do vaccines reduce immunity against diseases?[a]
In your opinion, do vaccines cause dangerous complications?[a]
In your opinion, are vaccines only to make profit to pharmaceutical companies?[a]
I do not have to take vaccines, since I am resistant to diseases, against which these vaccines protect[a]

[a] Items with reversed coding.

large city, and 40 in another family doctor's outpatient clinic in a small rural community in Poland. The sample was described in details in the first paper devoted to the development of the ATVS [4].

2.2. Study design

The construct validity of the scale has been tested by correlating the extracted subscales of the ATVS with the set of other tools, including scales and inventories widely used in psychology and health behaviour measurement. Moreover, we conducted estimation of known group differences by comparing levels of the PA-subscale and the NA-subscale in groups separated by value of some qualitative variables.

2.3. Construct validity

The construct validity is defined as the extent to which a scale behaves in the same way as the construct it means to measure should behave with regard to the established measures of other constructs [5]. This concept is directly concerned with the theoretical relationship between the variable measured by the scale and other variables [6]. We verified convergent and divergent aspects of the construct validity [7]. Assuming that personality traits, individual beliefs and habitual traits play a significant role in shaping particular attitudes, we compared the scores of the ATVS subscales with the measurements of anxiety, copying with stress, self-efficacy, health locus of control and health behaviours. Based on the characteristics of anxiety [8], we hypothesized that a high score of the NA-subscale would be associated with a high level of anxiety. Since the risk of illness is analyzed in the literature as a stressor [9], we assumed also that attitudes toward vaccination would be associated with styles of coping with stressful events. We expected a positive correlation between the PA-subscale toward taking vaccination and the task-oriented style, as well as between the NA-subscale and the emotional coping style. In reference to the various researches proving that self-efficacy is a predictor of the vaccination acceptance [10,11], we hypothesized that self-efficacy would be also positively associated with the PA-subscale toward vaccinations of older people. As an important difference between the subscales of the ATVS, we considered also a psychological trait of locus of control. We expected that the internal location of the health control is positively connected to the PA-subscale, and the external location based on chance to the NA-subscale. Finally, taking vaccines is considered also as one of the health behaviours. In accordance to the concept of cluster of health behaviours, we hypothesized that the PA-subscale would be positively associated with health-related behaviours, such as the general positive attitude, the proper nutrition habits, the performing prophylaxis i.e. health recommendations, health and pro-health practices.

2.4. Known group validity

As one of the aspects of the construct validity, we estimated the known group differences in regard to the current place of residence, level of education, living arrangement, convictions of the necessity of taking vaccines, lack of interest in vaccination and knowledge about vaccines, level of awareness of the consequences of illnesses, that the vaccinations should prevent them from health worries, doctors' advice regarding taking vaccines, relatives' encouragement, history of vaccination against various infectious diseases and self-care of the own health. Based on the review of literature we expected that individuals characterized by a higher level of education, awareness of health consequences, health worries or relatives' suggestions would have a higher level of the PA-subscale and a lower of the NA-subscale. Moreover, we hypothesized that individuals living alone may present a higher level of the NA-subscale and a lower of the PA-subscale.

2.5. Measures

To test the psychometric properties of the ATVS and assess its construct validity we correlated our scale with five tools measuring related concepts. The level of anxiety was assessed with the State and Trait Anxiety Inventory (STAI) [12–14], locus of control with the Multidimensional Health Locus of Control Scale (MHLC) [15]; the level of self-efficacy with the Generalized Self-Efficacy Scale (GSES) [16]; health-related behaviours with the Inventory of Health-Related Behaviours (IHRB) [17], and three coping styles: social diversion, task-oriented coping and emotion-oriented coping with the Coping Inventory for Stressful Situations (CISS) [18]. The comparison of the ATVS with the listed tools was performed on the dimensional level.

2.6. Statistical analysis

The analysis of the construct validity was conducted using Pearson r correlation coefficient. Known group differences were assessed using Mann-Whitney test for comparison of two groups and Kruskal-Wallis test for comparison of more than two groups. The values of test probability lower than 0.05 were considered significant.

3. Results

3.1. Construct validity

We found statistically significant correlations of the PA-subscale and the NA-subscale with several scales measuring psychological concepts assumed to be related to the proposed construct of attitudes towards vaccination. The results of the construct validity analysis are shown in the Table 2. The scores of the PA-subscale correlated positively with the task-oriented style of coping and with all subscales of IHRB, the most strongly with the Positive Attitudes (PA) and the proper Nutrition Habits (NH).

On the other hand, the NA-subscale correlated negatively with the task-oriented style of copying and positively with the external locus of health control based on chance. It was also strongly positively connected to the anxiety as the trait and much weaker to the emotion-oriented style of coping. Some significant negative correlations exist between the NA-subscale, and both the generalized self-efficacy and the internalized locus of control. Moreover, the NA-subscale correlates negatively with self-rated health and self-assessment of risk of developing influenza.