

# Health Belief Model Scale for Human Papilloma Virus and its Vaccination: Adaptation and Psychometric Testing



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## ABSTRACT

**Study Objective:** To adapt and psychometrically test the Health Belief Model Scale for Human Papilloma Virus (HPV) and Its Vaccination (HBMS-HPVV) for use in a Turkish population and to assess the Human Papilloma Virus Knowledge score (HPV-KS) among female college students.

**Design:** Instrument adaptation and psychometric testing study.

**Setting and Participants:** The sample consisted of 302 nursing students at a nursing school in Turkey between April and May 2013.

**Interventions:** Questionnaire-based data were collected from the participants.

**Main Outcome Measures:** Information regarding HBMS-HPVV and HPV knowledge and descriptive characteristic of participants was collected using translated HBMS-HPVV and HPV-KS. Test-retest reliability was evaluated and Cronbach  $\alpha$  was used to assess internal consistency reliability, and exploratory factor analysis was used to assess construct validity of the HBMS-HPVV.

**Results:** The scale consists of 4 subscales that measure 4 constructs of the Health Belief Model covering the perceived susceptibility and severity of HPV and the benefits and barriers. The final 14-item scale had satisfactory validity and internal consistency. Cronbach  $\alpha$  values for the 4 subscales ranged from 0.71 to 0.78. Total HPV-KS ranged from 0 to 8 (scale range, 0-10;  $3.80 \pm 2.12$ ).

**Conclusion:** The HBMS-HPVV is a valid and reliable instrument for measuring young Turkish women's beliefs and attitudes about HPV and its vaccination.

**Key Words:** Adaptation, Psychometric testing, Health beliefs, HPV vaccination

## Introduction

The human papilloma virus (HPV) is one of the most common sexually transmitted disorders. HPV is thought to cause more than half a million cases of cancer annually in developing countries, especially in women.<sup>1</sup> Primary protection from HPV includes the elimination of sexual risk factors and prophylactic vaccine administration.<sup>2-4</sup> The US Food and Drug Administration has approved 3 safe and effective vaccines that prevent infection by the most prevalent cancer-causing HPV: the bivalent HPV vaccine, the quadrivalent HPV vaccine and, a new 9-valent HPV vaccine. The bivalent HPV vaccine has been recommended for women aged 9-25 years for the prevention of cervical cancer, cervical intraepithelial neoplasia (CIN) 2, adenocarcinoma in situ, and CIN 1 caused by oncogenic HPV genotypes 16-18.<sup>5</sup> The quadrivalent HPV vaccine was approved for men and women aged 9-26 years to prevent a range of diseases, including genital warts, cervical cancer, cervical adenocarcinoma in situ, CIN, and high-grade vulvar and vaginal intraepithelial neoplasia caused by HPV genotypes 6, 11, 16, and 18.<sup>1,4-6</sup> The 9-valent HPV vaccine was also approved by the US Food and Drug Administration on December 10, 2014, for use in women aged 9-26 years, and

men aged 9-15 years. The 9-valent HPV vaccine targets HPV 6, 11, 16, 18, and 5 additional cancer-causing HPV types (31, 33, 45, 52, and 58), which account for approximately 15% of cervical cancers.<sup>7</sup>

HPV vaccines have been shown to be safe and well tolerated with high immunogenicity in preapproval clinical studies. Postmarketing studies have also not revealed any serious safety concerns.<sup>1,5</sup> The Centers for Disease Control and Prevention (CDC) reports that an additional 53,000 cervical cancer cases could be prevented by increasing HPV vaccination rates to 80% in the target group.<sup>5</sup> Since vaccine licensure, the HPV vaccine coverage among adolescents has increased. However, it still remains low not only in the United States, but also around the world.<sup>6,8,9</sup>

## Background

Many previous studies have determined the factors that influence the acceptance of HPV vaccines and have emphasized the importance of activities to eliminate the negative influence of such factors on vaccination. These studies have evaluated many factors thought to possibly affect the acceptance of vaccination, such as the demographic characteristics of the adolescents or parents, their knowledge about HPV and HPV vaccination, and their views, attitudes, and health beliefs.<sup>2,9-13</sup> HPV is a sexually transmitted disease, and the health beliefs related to HPV vaccination are therefore likely to be significantly influenced by sociocultural differences. However, there are only

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a few studies on this subject.<sup>2,8,11,12,14</sup> These studies have been conducted to evaluate the health beliefs regarding HPV and HPV vaccination using various measures.

To identify the barriers and factors that facilitate HPV vaccination of individuals, the use of standard tools enables more accurate comparison of these factors across groups.<sup>9</sup> Allen et al evaluated the measures used in HPV vaccine acceptance studies and reported that the use of a theoretical framework, structural consistency, and more rigorous validation of measures in a larger number of samples are required to develop successful societal and clinical interventions.<sup>15</sup> These results indicate a need to evaluate factors that influence vaccination with standard measures and a more systematic approach in the national and international literature. A number of theories have been used to clarify, predict, and change health behavior.<sup>16</sup>

The Health Belief Model (HBM) is based on motivation theory and indicates how one's behavior to protect oneself is shaped and identifies the influential factors.<sup>17</sup> The HBM states that the development of a health behavior by an individual depends on the individual person at risk for the disorder, their beliefs that a disease and its consequences can be serious, the perception of benefit in the behavior of preventing or decreasing the risk of the disease, and the perception of obstacles related to realization of the behavior.<sup>11</sup> Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, self-efficacy, and cues to action are the concepts that compose the HBM.

Perceived susceptibility refers to an individual's own perception of the chances of experiencing a condition that would adversely affect health. Perceived severity is the belief in the potential serious consequences of a health issue and interpretation of the degree of intensity of a disease. Perceived benefits are the beliefs in the advantages of adopting suggested prevention methods for a given health issue and actions taken to prevent disease. Perceived barriers refer to potential negative aspects of a particular health action or perceived barriers such as costs and side effects that would prevent individuals from practicing a recommended behavior. Self-efficacy is a belief that one can achieve the behavior required to execute the outcome, and cues to action refers to factors that trigger action.<sup>17,18</sup>

The HBM has been applied to numerous screening behaviors. Nurses can use the HBM to help determine health behavior, understand the behavior modification process, and support individuals for behavior modification in necessary areas.<sup>3,17</sup> The HBM has been used for predicting HPV vaccine acceptability. The literature on the role of HBM constructs is limited with regard to HPV vaccination acceptability among women.<sup>19</sup> No scale has been found in the national literature to evaluate individual health beliefs for HPV vaccination. Further understanding of how knowledge, sociocultural attitudes, and health beliefs predict HPV vaccination will guide the development of effective interventions to increase intentions of HPV vaccine use.

#### *Aim of the Study*

The aim of this study was to adapt the Health Belief Model Scale for Human Papilloma Virus and Its Vaccination

(HBMS-HPVV) into Turkish, to explore its construct validity and reliability, and to evaluate health beliefs toward HPV and its vaccination, HPV-related knowledge, and the HPV vaccination intentions of female college students.

#### **Materials and Methods**

The study was an instrument adaptation and psychometric testing study.

#### *Participants*

Participants in this study were recruited from the nursing student population at a state university in Ankara in the academic year 2012–2013. The study sample consisted of a total of 390 participants made up of undergraduate students. A total of 324 students volunteered to participate in the study. Twenty-two students were dropped from the analysis because of incomplete data. Statistical analysis was carried out with a total of 302 participants (77.4%).

#### *Instrument*

##### *Demographic Characteristics*

A short questionnaire that included items about demographic characteristics of participants such as age, place of residence, and parents' educational level was used. Participant's previous status of hearing about HPV vaccination and infection were also determined in this questionnaire.

##### *HPV Knowledge Scale*

The original HPV Knowledge Scale (HPV-KS) was developed by Kim in 2012 and consists of 20 questions.<sup>14</sup> It is used to measure the level of knowledge of the subjects regarding HPV infection and HPV vaccination. We used the short form, which includes 10 knowledge statements from Kim's HPV-KS.<sup>14</sup> For every knowledge statement, 1 point was given for answering correctly (true or false), and no points were given for choosing the wrong answer or the "do not know" option. A total knowledge score was derived by summing the number of correct responses. In Kim's study, Cronbach  $\alpha$  of the HPV-KS was 0.88.<sup>13</sup> In the current study, Cronbach  $\alpha$  was calculated as 0.85.

##### *The HBMS-HPVV*

The health beliefs regarding HPV and its vaccination were measured using the HBMS-HPVV adapted from a scale developed by Kim in 2012 for measuring health beliefs toward HPV vaccination. In Kim's study, the items pertaining to health beliefs toward HPV vaccination consisted of 12 items on perceived benefits (3 items), perceived susceptibility (2 items), perceived severity (2 items), and perceived barriers (5 items).<sup>14</sup> The HBMS-HPVV is a 4-item Likert-type scale in which subjects are asked to evaluate their agreement with some statements on a scale from 1 ("not at all") to 4 ("very much"). The Cronbach  $\alpha$  values in the original study were 0.85, 0.83, 0.74, and 0.85.<sup>14</sup>

The language equivalence of the HBMS-HPVV was determined through 3 independent translations and using the "back-translation" method. The first translator translated the original scale from English to Turkish, and the

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