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Psychometric properties of the Persian version of the osteoporosis knowledge and health belief questionnaires

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1. Introduction

Osteoporosis has emerged as one of the most common diseases in the aged population. Approximately 25% of women and 10% of men aged 60 years or above are affected by osteoporosis [1]. Osteoporosis is one of the most significant public health problems in the world because it pre-disposes to fractures with minimal or no antecedent trauma. These fractures are, in turn, associated with increased mortality, reduced quality of life and high health care costs [2]. Prevention, including regular physical activity and adequate calcium intake, is recognized as a valuable strategy to reduce the prevalence and burden of osteoporosis [3–7].

Lack of knowledge of osteoporosis and mistaken health beliefs have been found to influence the intake of calcium and exercise [8], and other osteoporosis-related behaviours [9]. Therefore, osteoporosis knowledge and health beliefs can potentially be important behavioural components in a preventive program [10]. Yet, recent studies have suggested that knowledge concerning risk factors and prevention of osteoporosis in women is inadequate [11,12], and that this inadequacy may explain the lack of treatment among even high-risk individuals [13].

Recently, three sets of generic instruments (osteoporosis knowledge test, OKT [14,15]; osteoporosis health belief scale, OHBS [15–17] and osteoporosis self-efficacy scale, OSES [15,18,19]) have been developed for clinicians and researchers to assess osteoporosis knowledge, health belief and self-efficacy in the general population. The existing literature, primarily published by the developer, supports the validity of the instruments [15]. However, little is known about the applicability, reliability and consistency of the instruments aside from the population in which they were originally developed and validated in non-English speaking populations. The purpose of the present study was to examine the reliability, internal consistency as well as construct validity of the instruments for the assessment of osteoporosis knowledge, beliefs and self-efficacy in a linguistically distinct, Iranian population.

2. Methods

2.1. Setting and subjects

A sample of 120 Iranian women, aged 35 years and older, participated in this study. The women were

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recruited via a media campaign using newsletters, noticeboards in community halls as well as word of mouth at community centres. Data collection took place over 1-year period. Inclusion criteria for the present study were first generation of Iranian women, living in Sydney, aged 35 years or older. Because the women were participants in a larger osteoporosis study in which bone mineral density was measured, certain exclusion criteria were applied. The exclusion criteria were: current or past occurrence of any medical conditions known to affect bone metabolism such as Paget's disease and stroke, currently pregnant and/or a history of breastfeeding within the last year. The study was approved by the University of New South Wales's Human Research Ethics Committee and written informed consent was obtained from each participant.

2.2. Instruments and measurements

Subjects completed three structured questionnaires on osteoporosis knowledge test, osteoporosis health belief scale and osteoporosis self-efficacy scale. Furthermore, data were collected on demographic information including age, weight, height, education, employment and marital status.

The osteoporosis knowledge test [14] is a 24-item, multiple-choice questionnaire that designed to measure knowledge about risk factors for osteoporosis and strategies for prevention in terms of exercise and calcium intake. The items are grouped into two subscales: OKT calcium and OKT exercise. The two subscales share nine common items. For example, which of the following exercises is the best way to reduce a person's chance of getting osteoporosis?

A. Bowling
B. Doing laundry
C. Aerobic dancing
D. Do not know

The osteoporosis self-efficacy scale [19] was designed to measure the level of confidence of an individual in undertaking osteoporosis preventive measures, particularly related to physical activity and calcium intake. The instrument has 12 items grouped into two subscales: OSE calcium and OSE exercise. Each subscale includes six items. The possible score for each item on a visual analogue scale ranges from 0 for "not at all confident" to 100 for "very confident". For example,

begin a new or different exercise program:

Not at all confident – – – – – – Very confident

The osteoporosis health belief scale [16] was designed to assess the perception of osteoporosis risk and health beliefs related to osteoporosis prevention, based on health belief model constructs [17]. The OHBS has 42 items grouped into seven subscales: perceived susceptibility of osteoporosis, perceived seriousness of osteoporosis, barriers to calcium intake, barriers to exercise, benefits of calcium intake, benefits of exercise and motivation to perform preventive measures. Each subscale includes six items. Each item has five possible values scored in a Likert-style scale from one for "strongly disagree" to five for "strongly agree". For example, your chances of getting osteoporosis are high: strongly disagree, disagree, neutral, agree and strongly agree.

2.3. Translation to Persian

In the present study, two bilingual translators, whose native language is Persian, translated the English version of the questionnaires into Persian. Each translator prepared a separate translation. The Persian versions were then discussed between the translators to arrive at a consensus. To assess the conceptual equivalence, the Persian version was translated back into English by a third bilingual expert in English and Persian. After the original translation and back-translation process were completed, the instruments were pre-tested. Some further corrections and modifications were made at this stage. This procedure was followed for all three questionnaires.

For the purpose of evaluating test–retest reliability, a sample of 30 women was selected, and each instrument was administered twice to the selected women at an interval of 1–2 weeks.

2.4. Data analysis

Basic descriptive statistics (mean, standard deviation and proportion of correct choices) were calculated for all individual items and scales. For ease of compar-