

## Original Research Reports

# Application of the Chinese Version of the Whiteley Index-7 for Detecting DSM-5 Somatic Symptom and Related Disorders



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**Background:** *The Whiteley Index-7 (WI-7) is frequently used for evaluating patients with suspected hypochondriasis. However, information about its use on somatic symptom and related disorders in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) is still lacking. This study investigated the psychometric properties of the Mandarin Chinese version of the WI-7 and its application to evaluation of somatic symptom and related disorders.*

**Methods:** *Participants completed the WI-7 and received diagnostic interview based on both Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and DSM-5 criteria. Exploratory factor analysis was performed, and the test-retest reliability and the internal consistency of the WI-7 were assessed. Receiver Operating Characteristic curves were established, and the area under the curve was calculated to*

*determine the cutoff point to distinguish DSM-IV somatoform disorders and DSM-5 somatic symptom and related disorders, respectively.*

**Results:** *A total of 471 subjects were recruited for this study. The exploratory factor analysis of the WI-7 identified a single factor. The internal consistency and test-retest reliability of the WI-7 were 0.829 and 0.836, respectively. The area under Receiver Operating Characteristic curve using WI-7 to distinguish DSM-5 somatic symptom and related disorders is 0.660, higher than that when applying to distinguish DSM-IV somatoform disorders. The sensitivity and specificity at an optimal cutoff point of 0/1 are 0.645 and 0.675, respectively.*

**Conclusion:** *The Mandarin Chinese version of the WI-7 is a potentially useful tool to detect individuals with DSM-5 somatic symptom and related disorders.*

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**Key words:** Whiteley Index-7, hypochondriasis, somatoform disorders, somatic symptom and related disorders.

## INTRODUCTION

Hypochondriasis, as defined by the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV), is characterized by persistent preoccupation with fears of having a serious disease based on the person's misinterpretation of bodily symptoms.<sup>1</sup> The 6-month prevalence of hypochondriasis is estimated to be 4%–6% in the general medical clinic population.<sup>2</sup> The disorder is related to excessive health-related behaviors and results in increased

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## Application of the Whiteley Index-7 for Detecting *DSM-5* Diagnoses

health care costs.<sup>3,4</sup> However, some studies reveal that it is underdiagnosed in primary care settings.<sup>5</sup> Hence, a valid screening tool for identifying hypochondriasis in nonpsychiatric settings is necessary. A few self-report measures of hypochondriasis, such as the Health Anxiety Inventory, the Illness Attitude Scales, and the Whiteley Index (WI), are currently available for screening such patients.<sup>6</sup> Among these, the WI has been extensively validated in the current medical literature.<sup>5-8</sup>

The 14-item WI was first introduced by Pilowsky in the 1960s.<sup>9</sup> The index measures hypochondriacal traits, including “disease conviction,” “bodily preoccupation,” and “disease fear or worrying.”<sup>10</sup> It has been used both in its original and modified versions to evaluate hypochondriasis.<sup>10</sup> It has been incorporated into the 62-item Illness Behavior Questionnaire, which elucidated a patient’s attitudes, ideas, affects, and attributions in relation to illness.<sup>11</sup> In a reduced 7-item scale, that is, the WI-7, it detected somatoform disorders.<sup>10</sup> Fink et al.<sup>10</sup> reported that the WI-7 had acceptable psychometric profiles as well as good sensitivity and specificity, not only for the screening of hypochondriasis but also for screening of somatoform disorders. In addition, the brevity and simplicity of the WI-7 make it useful as a screening tool in primary care practices. Besides being a screening instrument for somatoform spectrum disorders, the WI-7 can also be used to predict the frequency with which the individual seeks health care<sup>12-16</sup> and provides information on self-rated health outcomes<sup>15</sup> in multiple health care settings, such as inpatient units and neurology clinics. It has also been used to measure treatment outcome of somatization,<sup>17</sup> functional somatic symptoms,<sup>18</sup> and medically unexplained symptoms.<sup>19</sup>

While decentralizing the concept of medically unexplained symptoms, the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (*DSM-5*) emphasizes the psychologic distress related to persistent somatic symptoms. Hence, individuals who have high levels of health anxiety but who do not fulfill the criteria for any somatoform disorder listed in the *DSM-IV* might be labeled with somatic symptom and related disorders in accordance with *DSM-5* criteria. For example, among patients with fibromyalgia, the prevalence rate of somatic symptom disorder was 25% based on “being bothered a lot by at least 1 symptom listed on the Patient Health Questionnaire-15” (PHQ-15) and “a total score on the WI  $\geq$  8.”<sup>20</sup> Furthermore, owing to the *DSM-5*’s B2 criterion of somatic symptom

disorder, which describes health-related anxiety, most individuals with *DSM-IV* hypochondriasis might instead be diagnosed as having a somatic symptom disorder.<sup>21</sup> Hence, we hypothesize that the WI-7 might be extended as a useful screening tool to detect somatic symptom disorders and may have a role in clarifying the full spectrum of somatic symptom and related disorders in *DSM-5*.

The WI-7 has been a widely used screening tool since its development; however, its use has been confined mostly to Western populations. The only existing study of psychometric properties of the WI-7 conducted among Chinese and other Asian populations was from Hong Kong.<sup>2</sup> In this study, Lee et al. showed satisfactory internal consistency and a stable 1-month test-retest reliability of the Chinese version of WI-7 in the general population of Hong Kong. Thus, the Chinese version of the WI-7 is considered a promising tool for examination of health anxiety.<sup>22</sup> In addition, higher WI-7 total scores have been associated with more somatic distress, greater role impairment, more health care visits, and less patient satisfaction with help-seeking experiences. The WI-7 has also been modified into a 5-item version to measure health anxiety. Study by Lee et al. demonstrates the association of health anxiety with psychologic distress, and the study results also showed that functional impairment and health care utilization are independent from somatic symptom burden. However, whether the WI-7 could be used to screen for *DSM-5* somatic symptom and related disorders was not mentioned in the study in Hong Kong. In addition, the WI-7 has not been validated in Taiwan, where the text of the Chinese version questionnaire warranted refinement to be more colloquial, in consideration of differences in spoken language and culture.

The present study aims to examine the psychometric properties of the WI-7 in the assessment of health anxiety among the Taiwanese Han Chinese population. In addition, based on previous reports, we hypothesized that the WI-7 would be suitable for use for screening of *DSM-5* somatic symptom and related disorders.

## MATERIALS AND METHODS

### Recruitment and Participants

Institutional Review Board approval was obtained from National Taiwan University Hospital before

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