



The Chinese Version of the Gotland Male Depression Scale (GMDS): Mokken scaling



Chin-Pang Lee^{a,d}, Chun-Lin Chu^{a,d,e}, Yu Chen^{b,d,e}, Kun-Hao Jiang^{c,d,e}, Jiun-Liang Chen^{c,d,e}, Ching-Yen Chen^{a,d,e,*}

^a Department of Psychiatry, Chang Gung Memorial Hospital, Linkou branch, Taiwan

^b Department of Urology, Chang Gung Memorial Hospital, Linkou branch, Taiwan

^c Department of Traditional Chinese Medicine, Chang Gung Memorial Hospital, Linkou branch, Taiwan

^d Men's Health Center, Chang Gung Memorial Hospital, Taoyuan branch, Taiwan

^e School of Medicine, Chang Gung University, Taoyuan, Taiwan

ARTICLE INFO

Article history:

Received 27 May 2015

Received in revised form

21 June 2015

Accepted 26 June 2015

Available online 21 July 2015

Keywords:

Mokken scale analysis

Gotland Male Depression Scale

Item response theory

Men

Item ordering

ABSTRACT

Objective: Invariant item ordering (IIO) is defined as the extent to which items have the same order for each respondent who completes a scale. IIO is crucial for establishing a scale hierarchy that is replicable across samples; however, no research has demonstrated IIO in the Gotland Male Depression Scale (GMDS). The aim of this study was to determine if an IIO hierarchy of depressive symptoms existed in a clinical sample of men who completed the GMDS.

Methods: A convenience sample of 231 men (age: mean (SD) = 46.1 (11.0) yrs) who visited a men's health polyclinic in Taiwan and completed the GMDS. Mokken scale analysis was conducted to evaluate the psychometric properties of the GMDS.

Results: All items on the GMDS formed a strong uni-dimensional scale ($H=0.592$). Except for item #9 (alcohol/drug abuse, or hyperactivity), IIO was found for the remaining 12 items ($H^T=0.366$). These symptoms reflected the following hierarchy: positive family history (#13), complaining (#12), anxiety (#8), loss of vitality (#10), depressed mood (#11), indecisiveness (#6), aggression (#2), irritability (#5), stress (#1), burn-out (#3), fatigue (#4), and sleep problems (#7).

Conclusion: The GMDS is a psychometrically sound measure of depressive symptoms in Taiwanese male outpatients. The GMDS has both cumulative and hierarchical properties.

© 2015 Elsevier B.V. All rights reserved.

1. Introduction

Depression in men is a severe problem that can lead to consequences such as substance abuse, sexual dysfunction, domestic violence, pathological gambling, and even suicide (Kilmartin, 2005). Wålinder and Rutz (2001) have postulated a "male depressive syndrome" characterized by low stress tolerance, acting-out behavior, low impulse control, substance abuse, a hereditary loading of depressive illness, alcoholism, and suicide. Based on this construct of a "male depressive syndrome", Zierau et al. (2002) developed the Gotland Male Depression Scale (GMDS) to improve the recognition of depression in men. The GMDS is a 13-item self-administered questionnaire measuring the two dimensions of

depression and distress. The sum scores of the GMDS and its subscales are typically used to represent the severity of symptoms and impairment without any weighting.

Sum scores assume that all items are equally correlated with the measured underlying construct and that the point intervals are equal on the scale; however, these assumptions are unrealistic and unjustified (Streiner and Norman, 2008). The items on the GMDS are rank-ordered and are not linear and continuous measurements; this means that calculating the item scores might be meaningless.

Two different approaches for the evaluation of the psychometric properties of rating scales are classical test theory (CTT) and item response theory (IRT) (Streiner and Norman, 2008). Using CTT, healthcare professionals can understand the agreement among answers to different items in an instrument (Cronbach's α) and know the extent to which the scores of a measure are related to a known standard measure with related concepts (Chang et al., 2015). The limitations of CTT include the summated scale

* Corresponding author at: Department of Psychiatry, Chang Gung Memorial Hospital, Linkou branch No. 5, Fusing St., Gueishan Dist., Taoyuan City 33305, Taiwan.

E-mail address: psycychen@yahoo.com.tw (C.-Y. Chen).

problems previously mentioned and its predominantly person- and test-level statistics. Both person- and test-level statistics are sample dependent in CTT and may result in different psychometric properties when based on different samples (Amin et al., 2012; Chang et al., 2015).

IRT overcomes the main disadvantages of CTT, as it provides item-level statistics that are not affected by different samples (Streiner and Norman, 2008; Amin et al., 2012; Chang et al., 2015). IRT states that scale items can be ordered along levels of a latent trait, with item “difficulty” demonstrating whether items are difficult/severe (rare) or less difficult (common) (Embretson and Reise, 2000). A hierarchy of items can therefore be established using item response theory. As an example, Guttman scaling is a positive endorsement of one binary item of given difficulty and indicates that the remaining items of lesser difficulty have also been endorsed (Guttman, 1950). On a Guttman scale, a single response can be used to predict responses to all items on the scale.

Mokken models belong to the class of nonparametric item response theory (NIRT) models (Mokken, 1971; Sijtsma and Molenaa, 2002). Mokken scale analysis (MSA) is a probabilistic version of Guttman scaling and can be applied to dichotomous or polytomous items (Mokken, 1971). In the field of health construct measurements, MSA can not only be applied to design questionnaires or tests, but can also be used to scrutinize the appropriateness and performance of the measurements (Stochl et al., 2012). MSA consists of two parts.

(1) An automated selection algorithm which partitions a set of ordinal variables (from here on called items) into scales (called Mokken scales) satisfying criteria related to NIRT models and possibly leaving some items unselected, and (2) methods to investigate assumptions of NIRT models.

The underlying assumptions of Mokken models are unidimensionality, local independence, and latent monotonicity (Mokken, 1971). The assumption of unidimensionality means that all items from the same instrument measure the same latent trait θ . Local independence refers to an individual's response to an item not influenced by his or her responses to the other items in the same test (Sijtsma and Junker, 1996). Latent monotonicity means that for each item, the probability of a particular response level is a monotonically non-decreasing function of the latent trait θ (Stochl et al., 2012).

There are two main Mokken models: the monotone homogeneity model (MHM), and double monotonicity model (DMM) (Mokken, 1971). The MHM assumes unidimensionality, monotonicity, and local independence of the items within a scale. If these assumptions are met, then the simple sum score of the items within a scale can be used for ordinal personal measurement (Mokken, 1971; Van der Ark, 2012). The DMM assumes unidimensionality, monotonicity, local independence and non-intersection of items within a scale. If these assumptions are met, then the items not only have the same features as the MHM, but they also have the property of invariant item ordering (IIO) (Sijtsma and Junker, 1996).

IIO is defined as the extent to which items have the same order for each respondent who completes a scale (Van der Ark, 2012; Doyle et al., 2012). The ordering of items is based on item difficulty, and shows whether items are difficult [rare] or less difficult [common]. IIO refers to items that have the same order of “difficulty” irrespective of the value of the latent trait. IIO allows the researcher to order items according to their difficulty (facility) or commonality/prevalence; IIO also helps researchers to communicate useful features of the hierarchical ordering of scale items to users (Stochl et al., 2012). IIO is therefore crucial for establishing a scale hierarchy that is replicable across samples. In addition, if the DMM fits the item response data, then the IIO property can also be expected to hold in any subgroup from the same population and

thus is considered to be in some sense “person-free”.

To the best of our knowledge, only one study has used MSA to examine the psychometric properties of the GMDS (Zierau et al., 2002). Zierau et al. (2002) suggested that the unidimensionality of the GMDS was weak, and they did not further examine whether the GMDS demonstrated with IIO. In the present study, we aimed to apply MSA to the GMDS. The purposes of the present study were: (1) to examine the construct validity of the GMDS, and (2) to determine if a hierarchy of depression could be demonstrated with IIO.

2. Methods and materials

2.1. Sample

We reanalyzed the data from the validation study of the Chinese version of the GMDS (Chu et al., 2014). The present study used a cross-sectional design in a convenience sample from the men's health polyclinic in the Chang Gung Memorial Hospital, Taoyuan branch. The polyclinic has three specialties: urology, psychiatry, and traditional Chinese medicine. We defined a case as a male outpatient who initially visited the men's health polyclinic from July 2008 through March 2009. The inclusion criteria were: (1) a resident of Taiwan; and (2) the ability to read and understand Traditional Chinese characters. The exclusion criteria were: (1) psychotic symptoms, and (2) visual, language or communication difficulties. In all, we recruited 231 adult men (age: mean (SD) = 46.1 (11.0) yrs) for the present study. Table 1 shows the socio-demographic characteristics of the sample.

2.2. Procedure

Each man provided explicit written informed consent for the study prior to participation. Participants were invited to take part in a 20–30 min assessment interview by a trained research assistant. They also completed the Aging Male Symptoms scales during their intake visits. The present study complied with the guidelines of the Declaration of Helsinki. All aspects of data collection received ethical approval from the Institutional Review Board (IRB) of the Chang Gung Memorial Hospital in northern Taiwan. All individual information was securely protected by delinking identifying information from main datasets and sources, and it was available only to investigators.

2.3. Gotland Male Depression Scale (GMDS)

The GMDS is composed of 13 self-reported items divided into two subscales (Table 2). The distress subscale contains items #1, #2, #5, #8, #9, #10, and #12, and the depression subscale contains items #3, #4, #6, #7, #11, and #13. Each question is rated on a 4-point Likert scale from 0 to 3, and thus the total score can range

Table 1
Demographic and clinical characteristics of the sample ($N = 231$).

Characteristics	Statistics
Age, mean (SD), yrs	46.1 (11.0)
< 40 yrs, N (%)	62 (26.8)
40–49 yrs, N (%)	81 (35.1)
50–59 yrs, N (%)	63 (27.3)
≥ 60 yrs, N (%)	25 (10.8)
High school or above education, N (%)	180 (77.9)
Currently employed, N (%)	179 (77.5)
Currently married or cohabiting, N (%)	47 (20.4)

Download English Version:

<https://daneshyari.com/en/article/6231119>

Download Persian Version:

<https://daneshyari.com/article/6231119>

[Daneshyari.com](https://daneshyari.com)