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Psychometric properties of the Drive for Muscularity Scale in Malay men

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ABSTRACT

The Drive for Muscularity Scale (DMS) is a widely used measure in studies of men's body image, but few studies have examined its psychometric properties outside English-speaking samples. Here, we assessed the factor structure of a Malay translation of the DMS. A community sample of 159 Malay men from Kuala Lumpur, Malaysia, completed the DMS, along with measures of self-esteem, body appreciation, and muscle discrepancy. Exploratory factor analysis led to the extraction of two factors, differentiating attitudes from behaviours, which mirrors the parent scale. Both factors also loaded on to a higher-order drive for muscularity factor. The subscales of the Malay DMS had adequate internal consistencies and good convergent validity, insofar as significant relationships were reported with self-esteem, body appreciation, muscle discrepancy, and body mass index. These results indicate that the Malay DMS has acceptable psychometric properties and can be used to assess body image concerns in Malay men.

Introduction

Drive for muscularity refers to a desire to enhance one's musculature in order to reduce a perceived discrepancy between actual and ideal levels (McCreary & Sasse, 2000). Higher drive for muscularity has been consistently associated with a range of unhealthy behaviours (e.g., exercise dependence) and psychological outcomes (e.g., anxiety; McCreary, 2012; Morrison, Morrison, Hopkins, & Rowan, 2004). In addition, higher drive for muscularity is consistently observed in men compared with women, suggesting that the construct is differentially salient across sex, possibly because of the sociocultural emphasis placed on muscularity in ideals of men's physical attractiveness (Edwards, Tod, Morrison, & Molnar, 2012; Swami & Tovée, 2005). Although a number of different drive for muscularity measures exist (Tod & Edwards, 2013), the most widely used is McCreary and Sasse's (McCreary & Sasse, 2000) Drive for Muscularity Scale (DMS): Tod and Edwards (2013) estimated that approximately 70% of studies of drive for muscularity have used the DMS.

The DMS is a self-report measure consisting of 15 items that are rated on a 6-point scale ranging from 1 (*Always*) to 6 (*Never*). Through factor analysis with data from North American men, the DMS was found to consist of two factors, called Muscularity-Oriented Body Image Attitudes (7 items) and Muscularity-Oriented Behaviours (7 items; McCreary, Sasse, Saucier, & Dorsch, 2004). In this analysis, however, one item (#10, which asks about the extent to which respondents think about using anabolic steroids to increase muscle mass) was found to have very little variability and was omitted from the subscale computations. In some samples, however, this item has sufficient variability and loads onto the Behaviours subscale (McPherson, McCarthy, McCreary, & McMillan, 2010). Both subscales also load onto a single higher-order DMS factor (McCreary et al., 2004) and, for this reason, some scholars have preferred total scores over subscale scores (e.g., Benford & Swami, 2014; Davis, Karvinen, & McCreary, 2005; Swami, Diwell, & McCreary, 2014; Swami, Neofytou, et al., 2013). Both subscale and total scores have very good internal consistency coefficients, test–retest reliability, and patterns of concurrent, convergent, and discriminant validities (McCreary, 2007).

With few exceptions, however, the psychometric properties of the DMS have not been examined outside English-speaking populations. Using confirmatory factor analysis (CFA) with Spanish-speaking Argentinian university students, Compte, Sepúlveda, de Pellegrin, and Blanco (2015) reported that the original two-factor

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model had good fit, with item #10 loading onto the Behaviours subscale. Total scores and subscale scores both showed good internal consistencies and good patterns of convergent and concurrent validity. Likewise, a German translation of the DMS with data from weight-training men found support for the two-factor model, with item #10 again loading onto the Behaviours subscale (Waldorf, Cordes, Vocks, & McCreary, 2014). Scores on this German translation were also found to have good internal consistency, test–retest reliability, and discriminant validity.

However, not all translation studies have found support for the original two-factor model. Using confirmatory factor analysis (CFA) with a mixed sample of Brazilian men, Campana, Tavares, Swami, and da Silva (2013) found that the two-factor model only achieved adequate fit following the elimination of three items (#7, 9, and 10) that had high residuals. These authors also tested a hypothesised three-factor model, but found that it had poorer fit compared to the modified two-factor model. Using exploratory factor analysis (EFA), support has been found for a three-factor model in Mexican university students (Escoto et al., 2013). While the Attitudes subscale mirrored its parent version ($\alpha = .87$), the Behaviours subscale was split into lower-order dimensions reflecting substance intake ($\alpha = .72$) and training adherence ($\alpha = .68$). A CFA with a second sample of men confirmed that this three-factor model, as well the original two-factor model, had adequate fit. Given that the internal consistency of one factor in the three-factor model was below the accepted cut-off, it is not clear whether there is much support for using the three-factor solution over the original two-factor model.

In addition, French (Rodgers, Ganchou, Franko, & Chabrol, 2012), Icelandic (Guðnadóttir & Garðarsdóttir, 2014), and Swedish (Holmqvist Gattario et al., 2015) translations of the DMS appear to have been completed. While the authors of these studies report that total and/or subscale scores had good internal consistency coefficients, they do not appear to have examined the factor structure of the DMS. This is problematic because it should not be assumed that factor structure identified during the development of a measure will necessarily generalise to other populations and linguistic contexts (American Educational Research Association, American Psychological Association, & National Council on Measurement in Education, 2014). Rather, an examination of a measure's factor structure is important when the measure is used with different populations or in new cultural contexts.

Following from this point, we sought to examine the factor structure of the DMS among Malaysian men in Malaysia. As discussed by Swami, Tovée, and Harris (2013), Malaysia is an interesting context in which to examine issues related to body image for a number of reasons. First, rapid liberalisation and industrialisation since the late 1980s have encouraged the deregulation of mass media, allowing for the proliferation of Westernised ideals of beauty (Swami, 2006). Indeed, previous work in urban Malaysia has indicated that muscularity is idealised to a similar extent as in Europe (Swami & Tovée, 2005). In addition, Malaysia typifies a developing country in a nutritional and lifestyle transition, with a high prevalence of obesity along with micronutrient deficiency (e.g., Moy, Gan, & Zaleha, 2006). This has led to a legitimisation of a fear of fatness and may also contribute to high rates of body dissatisfaction among women and men (Swami, 2006; Swami, Neofytou, et al., 2013).

While a number of studies have examined body image issues in Malaysian men (e.g., Phan, Ang, Maznah, & Norimah, 2009), these studies have typically relied on models of body image developed to explain body dissatisfaction in women and have applied these models uncritically to explain men's body image (Swami, Neofytou, et al., 2013). A further problem with earlier work is the use of measures of uncertain validity and reliability. Some studies have asked respondents to complete questionnaires in English, rather than the national language of Bahasa Malaysia (Malay), or have assumed that scales developed in Western contexts will retain their factorial validity in Malaysian populations. This is a problematic assumption given evidence of that some body image scales developed among English-speaking samples do not retain their parent factor structure when translated into Malay (e.g., Swami, 2009; Swami & Chamorro-Premuzic, 2008).

In the present study, therefore, we examined the psychometric properties of a Malay translation of the DMS. More specifically, we first examined the factor structure of the Malay DMS using EFA, which allowed us to examine the best-fitting model for our dataset. Based on the available cross-cultural evidence, we expected the Malay DMS to have a two-factor structure, with both factors also loading on to a higher-order single drive for muscularity factor. In addition to examining factorial validity, we also assessed the internal consistency of the derived factors and, to establish the scale's convergent validity, we examined associations between drive for muscularity and self-esteem, body mass index (BMI), body appreciation, and current-ideal muscle discrepancy.

Method

Participants

Participants of this study were 159 Malay men recruited from the community in Kuala Lumpur, the national capital and largest city in Malaysia. Participants ranged in age from 18 to 69 years ($M = 28.78$, $SD = 9.35$) and in self-reported BMI from 16.42 to 36.33 kg/m^2 ($M = 22.93$, $SD = 2.94$). By constitutional law, all ethnic Malays in Malaysia are considered Muslim. In terms of marital status, the majority of the sample was married (64.2%), while 26.4% were single and the remainder of some other status. A total of 48.4% of the sample had completed minimum secondary schooling, 29.6% had an undergraduate degree, 13.8% had a postgraduate degree, and the remainder had some other qualification.

Measures

Drive for muscularity. Participants completed the 15-item DMS (McCreary & Sasse, 2000). All items were rated on a 6-point scale ranging from 1 (*Always*) to 6 (*Never*) and were reverse-coded prior to analysis so that higher scores reflect greater drive for muscularity. The factor structure and reliability of the DMS is described below and the items of the DMS are reported in Table 1.

Self-esteem. We used the 10-item Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965; Malay translation: Swami, 2011) to measure participants' overall sense of self-worth (sample item: "I feel that I have a number of good qualities"). The RSES is one of the most widely used measures of self-esteem, with items rated on a 4-point scale ranging from 1 (*Strongly disagree*) to 4 (*Strongly agree*). In its English version, five items are reverse-coded prior to analysis. In the Malay form, however, one of these reverse-coded items (#8) loads negatively, possibly due to interpretation issues; Swami (2011) recommends inclusion of this item in its non-reversed format, which is what we did here. A total RSES score was, therefore computed following reverse-coding of four items, with higher scores reflecting higher self-esteem. The Malay version of the RSES has adequate internal consistency, good test–retest reliability after 5 weeks, and good patterns of convergent and discriminant validity (Swami, 2011). In the present study, Cronbach's α for this scale was .83.

Body appreciation. Participants completed the Body Appreciation Scale (BAS; Avalos, Tylka, & Wood-Barcalow, 2005; Malay