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Original Article

Assessing acceptance in mindfulness with direct-worded items: The development and initial validation of the athlete mindfulness questionnaire

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Abstract

Purpose: The purpose of the current study was to develop and validate a sport-specific mindfulness measure, the Athlete Mindfulness Questionnaire (AMQ), through five related studies using four separate samples of Chinese athletes. The AMQ is a 3-factor measure designed to assess mindfulness that reflects present-moment attention, awareness, and acceptance in a sport context.

Methods: In Study 1, an initial pool of items was generated based on previous literature, existing mindfulness scales, as well as interviews with and feedback from the athletes, coaches, and mindfulness experts. Initial support for the 3-factor structure of the AMQ was established via exploratory factor analysis in Study 2, and cross-validated through confirmatory factor analysis in Studies 3 and 4. In Study 5, a modified 3-factor AMQ with direct-worded acceptance items was examined in a fourth independent sample.

Results: Convergent and concurrent validities of the acceptance subscale failed to be established in Studies 3 and 4 which may be due to the inattention and confusion of the athletes whilst interpreting the reverse-worded items. A modified 16-item AMQ in Study 5 displayed satisfactory model fit and acceptable internal consistencies. Most importantly, convergent and concurrent validities of the 16-item AMQ were supported. The three subscales showed significant positive associations with mindfulness, flow, well-being, and positive affect and significant negative associations with experiential avoidance, burnout, and negative affect.

Conclusion: The AMQ is a psychometrically sound measure of mindfulness in a sport context. The importance of using direct-worded acceptance items is discussed.

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Keywords: Athlete; Mindfulness; Reliability; Scale; Sport; Validity

1. Introduction

Mindfulness is described as frequent receptive attention to internal and external stimuli as they occur in Buddhist philosophy and practice.¹ It has been adopted by sport psychology researchers and practitioners to better understand and enhance the performance of athletes for over a decade.² The characteristic of not being passively resigned to, or dissociated from, but actively engaged in the observed experience of mindfulness,³ is consistent with the concept of ideal performance in a sport context. In this context, athletes must actively deal with or coexist with both internal (e.g., disruptive thoughts and emotions) and external stimuli (environmental or situational factors), while focusing on present-moment performance.^{3–5}

In a sport context, the ability to self-regulate attention to present performance, awareness of internal and external experiences of bodily sensations, emotions, thoughts, and cognitions, along with an accepting and non-judgmental attitude towards these experiences have been emphasized and cultivated under the general framework of mindfulness training.^{6,7} Accordingly, mindfulness-based approaches to performance enhancement and the general well-being of athletes have been developed.^{6–8} Preliminary evidence of the effectiveness of mindfulness interventions for athletes has revealed sport performance enhancement, increased mindfulness states, as well as other positive states such as flow, sport confidence, and well-being; and the decrease of negative affect such as anxiety, burnout, worries, and perfectionism.^{8–12}

On the other hand, examination of the associations between mindfulness and relevant key variables, such as flow,¹³ task-orientation,¹⁴ satisfaction,¹⁵ and sport performance¹⁶ in athletic populations, informs conceptual and intervention

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considerations in a sport context. Yet, existing evidence has not been built on measurements that had been specifically developed for athletes. Given that the sporting context is quite different from the context of daily life, in terms of the intensity of stimulus and the requirements of attention and awareness, sport-specific mindfulness scales are needed in order to more accurately assess mindfulness among athletic population.¹⁷ As such, Thienot and colleagues¹⁷ developed a 15-item Mindfulness Inventory for Sport (MIS), including three factors: awareness, non-judgmental attitude, and refocusing.

In the MIS, athletes are asked to assess their awareness of private experiences and their refocusing ability and nonjudgmental attitude after they become aware of these experiences. Yet, it is believed that attention and awareness should be viewed as two inter-related components instead of one component occurring after another.¹⁸ In other words, although awareness can bring attention to the present moment when the mind wanders, the nature of mindfulness is the present-moment attention and the awareness of the present-moment experiences even within a sport context. Furthermore, the original conceptualization of mindfulness¹⁹ and mindfulness practice^{20,21} stated that the present-moment attention contains refocusing capability. Therefore, the sole assessment of refocusing skills by neglecting the capability of sustaining attention on the present-moment performance might lead to the omission of important information.

To overcome the limitation in Thienot and colleagues¹⁷ conceptualization of mindfulness, the attentional component in the current research was conceptualized as comprising (a) sustained attention on the present-moment experience and (b) bringing the attention back to the present moment. In addition, the present-moment attention and non-judgment (or acceptance) are viewed as two independent components of mindfulness that occur simultaneously, rather than two components which occur subsequent to awareness. Grounded in the framework of mindfulness within the context of sport,⁶ we define mindfulness in terms of three components: present-moment attention, awareness, and acceptance.

In summary, the current research aimed to develop and preliminarily validate a scale that assesses athletes' dispositional mindfulness, entitled the Athlete Mindfulness Questionnaire (AMQ), via a series of five studies. The aim of Study 1 was to create a pool of items that captured the dispositional mindfulness of Chinese athletes, to gauge how applicable the items of the scale were in a sport context, and to provide evidence for the scale's content validity. The aim of Study 2 was to analyze the factorial composition of the items generated in Study 1 via an exploratory factor analysis. The aim of Study 3 was to cross-validate the findings of Study 2 using confirmatory factor analysis with another sample of athletes, and further refine the structure of the AMQ if necessary. The aim of Study 4 was to use another sample to cross-validate the structure of the model supported in Study 3. The convergent and concurrent validities of the AMQ were also examined in Studies 3 and 4. The aim of Study 5 was to validate the structure of a modified AMQ with direct-worded acceptance items, and examine its convergent and concurrent validity through testing its relationships with relevant concepts.

2. Method

2.1. Participants

In Study 1, participants were 27 Chinese athletes (16 males and 11 females) and eight Chinese coaches (6 males and 2 females); both were drawn from five sports (diving, gymnastics, synchronized swimming, table tennis, and wushu). The coaches' coaching experience ranged from 1 to 25 years (10.13 ± 9.28 , mean \pm SD). The athletes were between 18 and 27 years old (20.93 ± 2.29), competed at national ($n = 15$) or international ($n = 12$) levels, and their competitive experience ranged from 7 to 23 years (13.37 ± 4.34). A panel of seven Chinese mindfulness experts was also invited to review the content validity of the items. Table 1 shows participant details of Studies 2–5.

2.2. Measures

In Studies 2–5, AMQ items were rated on a 5-point Likert scale ranging from 1 (*never true*) to 5 (*always true*).

In Study 3, four instruments were used to build the convergent and concurrent validities of AMQ: (1) The Mindful Attention Awareness Scale (MAAS)¹⁸ is a unidimensional scale with 15 items that are rated on a 6-point Likert scale from 1 (*almost always*) to 6 (*almost never*); higher scores indicate higher level mindfulness. The Chinese translated MAAS demonstrated adequate reliability and validity among an athletic sample.²² (2) The Acceptance and Action Questionnaire II (AAQ-II)²³ is a 7-item self-report measure with items that are rated on a 7-point Likert scale, from 1 (*never true*) to 7 (*always true*); higher scores indicate higher levels of experiential avoidance. The AAQ-II demonstrated adequate reliability and validity in Chinese athletes.²⁴ (3) The Short Dispositional Flow Scale (SDFS)²⁵ is a 9-item scale, with one item measures each of the nine flow dimensions. The SDFS is rated on a 5-point Likert scale, ranging from 1 (*never*) to 5 (*always*). The SDFS demonstrated adequate reliability and validity among a Chinese athletic sample.²⁶ (4) The Training and Competition Well-being Scale (TCWS)²⁷ is a 6-item scale used to assess Chinese athletes' subjective well-being in their training and competition. All items on the TCWS are scored on 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*).

In Study 4, five instruments, subsequent to the procedure of translation and back-translation, were used to test the concurrent validities of the AMQ: (1) The Athlete Burnout Questionnaire (ABQ)²⁸ is a 15-item self-report instrument measuring three burnout subscales: emotional/physical exhaustion, reduced sense of accomplishment, and sport devaluation. Respondents were asked to indicate how often they felt or thought a certain way during the current season using a 5-point Likert scale ranging from 1 (*almost never*) to 5 (*almost always*). (2) The Subjective Vitality Scale (SVS)²⁹ is a 6-item unidimensional instrument used to measure individuals' levels of subjective vitality. Responses were provided on a 7-point Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). (3) The International Positive and Negative Affect Schedule Short Form (IPANAS-SF)³⁰ is a short form of PANAS used to measure individuals' positive and negative affect. It included 10 items,

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