

An Abbreviated Version of the Mindful Eating Questionnaire

Cecilia Clementi, PhD; Giulia Casu, PhD; Paola Gremigni, PhD

ABSTRACT

Objective: To assess the psychometric properties of the Mindful Eating Questionnaire (MEQ).

Methods: A total of 15 mindfulness experts evaluated the content of the 28 items and 5 factors of the MEQ. A sample of 1,067 Italian adults (61.4% women) completed the MEQ and other measures; 62 participants completed a 4-week test-retest.

Results: Content analysis reduced the MEQ to 20 items. Exploratory and confirmatory factor analyses supported a 2-factor model based on awareness and recognition of hunger and satiety cues. Factors showed adequate internal consistency ($\alpha = .75$ and $.83$, respectively) and test-retest reliability (intraclass correlation coefficient = 0.73 and 0.85 , respectively), and were associated in expected ways, although with small to moderate effect sizes, with general mindfulness, meditation experience, yoga practice, not being on a diet plan, and body mass index categories.

Conclusions and Implications: Findings provided evidence of validity and reliability for the 20-item MEQ and support its use by clinicians and researchers for addressing eating-related issues.

Key Words: mindfulness, mindful eating, confirmatory factor analysis, validity, reliability, weight management (*J Nutr Educ Behav.* 2017;49:352–356.)

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INTRODUCTION

Traditional restrictive diets have not been overly successful in reducing excess weight¹ whereas non-dieting programs that encourage eating in response to internal hunger and satiety cues resulted in improvements in eating patterns.² Mindful eating is a non-dieting emerging approach to healthy weight management^{3,4} that is based on awareness of physical and emotional sensations associated with eating and may help individuals adopting this approach to recognize and respond to internal cues of hunger and satiety.⁵ Mindful eating-based interventions were found to be effective in reducing obesity-related behaviors, promoting weight loss, and reducing psychological distress.^{6–8} In light of such promising results, researchers and clinicians need effective tools to measure mindful eating. Various self-

reports were developed to assess mindfulness.^{9,10} However, if mindfulness is a learned skill that can be developed with practice,¹¹ a measure developed in a specific domain may be more appropriate than a generic scale.

The Mindful Eating Questionnaire (MEQ)⁵ was developed and validated in the US to assess mindful eating and showed good criterion validity and reliability. Although the MEQ was used in many studies in different countries,^{12–17} its validity has not been tested in different cultures; thus, a cross-cultural assessment might be useful to assess its psychometric properties further. The authors of the MEQ⁵ also suggested evaluating this measure in different populations and assessing its test-retest reliability in future studies. Moor et al¹⁶ suggested explore the relationship of mindful eating further with body mass index (BMI) and physical activity, and the

authors of this study also considered individuals' actual dietary practice.¹

A criticism was made regarding the content of MEQ because it does not include an acceptance or nonjudgmental dimension, which is part of the general mindfulness construct.¹⁸ Indeed, MEQ items focus exclusively on how attention is directed toward internal hunger or satiety stimuli as opposed to emotional or external stimuli to guide eating behavior, and are all domain-specific. Overall, the numerous studies that used MEQ in the context of nutrition indicated that it is a useful tool for collecting information on these aspects of eating behavior.^{12–17} Therefore, the current study aimed to investigate the psychometric properties (ie, content, structural and criterion validity, and reliability) of MEQ in the Italian context, given the differences in dietary intake and nutrition guidelines between Italy and the US.¹⁹ The researchers also aimed to obtain an abbreviated version of the MEQ to be used in health contexts in which short tools are required owing to time constraints. Hypotheses regarding criterion validity were formulated *a priori*. Weak to moderate correlations were expected between MEQ scales and a general mindfulness measure, which were meant to measure similar but not overlapping constructs. From previous studies it was

Department of Psychology, University of Bologna, Bologna, Italy

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Address for correspondence: Paola Gremigni, PhD, Department of Psychology, University of Bologna, viale Berti Pichat, 5, Bologna, Italy; Phone: +39 0512091338; Fax: +39 051-243086; E-mail: paola.gremigni2@unibo.it

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expected that participants with meditation experience or practicing yoga would report higher mindful eating than would those with no such experiences,^{5,12,16} that obese and overweight people would report lower mindful eating than would normal-weight people,^{5,16,20} and that being on a restrictive diet would be associated with lower mindful eating.¹

METHODS

The Ethical Research Committee of Bologna University approved this cross-sectional validation study. All participants signed a consent form to participate in the study.

To address the MEQ content validity, 20 professionals who were mindfulness-certified instructors and working in the area of mindful eating were contacted via e-mail and sent a cover letter with the link to an online response form. Two criteria were used to evaluate the MEQ items²¹: how much each item represented mindful eating as described in the theoretical definition, and how each group of items represented the content domain described in the original study. Answers were collected on a scale from 1 (not representative) to 4 (representative). Fifteen experts completed the online form (75%).

To address structural and criterion validity and reliability, a large sample size was achieved to allow the sample to be randomly split into 2 adequately sized subsamples, and for the confirmatory factor analysis (CFA) model to converge without improper solutions.²² Therefore, 1,094 participants were recruited between January and December, 2014 in 4 yoga centers, 2 weight-loss centers, a mindfulness center, and several primary care offices, and were asked to complete a paper-and-pencil self-administered questionnaire. Eligibility criteria were being aged ≤ 18 years and able to read Italian. The final sample was reduced to 1,067 subjects because the questionnaire was incomplete. Table 1 lists participants' characteristics.

A test-retest sample size of 60 was established *a priori* to detect a Cohen's *d* effect size of ≥ 0.50 in the association between test and retest measures with a power of 95% and type I error rate of 0.05. Allowing for attrition, 80 participants were randomly selected and invited to complete the MEQ again after a 4-week interval. About 77% of them ($n = 62$) completed the retest.

Table 1. Sociodemographic Characteristics of Participants ($n = 1,067$)

Gender (female), n (%)	655 (61.4)
Age, y (mean \pm SD)	34.1 \pm 12.8
Education, y (mean \pm SD)	14.8 \pm 2.9 (5–21)
Meditation experience, n (%)	
None	940 (88.1)
Some	127 (11.9)
Type of physical activity, n (%)	
None	331 (31.0)
Aerobic	636 (59.6)
Yoga	100 (9.4)
Exercise frequency, h/wk (mean \pm SD)	2.8 \pm 3.1
Diet, n (%)	
No diet	858 (80.4)
Weight-loss/other restrictive diet	167 (15.7)
Alternative (vegetarian/vegan/macrobiotic)	42 (3.9)
Body mass index category, ^a n (%)	
Underweight (<18)	63 (5.9)
Normal (18–25)	666 (62.4)
Overweight (25–29.9)	227 (21.3)
Obese (>30)	111 (10.4)

^aBody mass index categories were based on the World Health Organization's classification.²⁵

There were no statistically significant differences ($P > .05$) in age, gender, and education level between subjects who completed the questionnaire and those who did not.

Measures

The MEQ is composed of 28 items rated 1 (never/rarely) to 4 (usually/always), with higher scores indicating greater degrees of mindful eating.⁵ Exploratory factor analysis (EFA) of the original scale resulted in 5 factors related to eating: awareness of physiological and psychological experiences (awareness; 7 items); ability to understand and stop eating when full (disinhibition; 8 items); not eating in response to negative emotions (emotional response; 4 items); attentiveness (distraction; 3 items); and awareness of external cues (external cues; 6 items). The MEQ scales showed Cronbach α 's in the .64–.83 range and adequate criterion validity, with positive associations with yoga practice and negative associations with BMI.⁵

The Freiburg Mindfulness Inventory (FMI)²³ evaluates aspects of general mindfulness using a 4-point scale ranging from 0 (rarely) to 3 (almost always). In this study a short 13-item version of FMI²⁴ was used that was formed by 2

scales: Presence (6 items) measuring attention-related aspects (eg, I am friendly to myself when things go wrong) and Acceptance (7 items) measuring non-evaluative, open, and curious attitude toward consciousness content (eg, When I notice an absence of mind, I gently return to the experience of the here and now). Cronbach α 's for this sample were .71 and .76, respectively, for the 2 scales. The MEQ and FMI were translated from English into Italian and then independently back-translated.

Sociodemographic (gender, age, and education) and anthropometric (self-reported weight in kilograms and height in meters) information was also collected, as reported in Table 1. Body mass index was categorized based on the World Health Organization guidelines.²⁵

Data Analysis

A content validity index (CVI) and factorial validity index (FVI) were computed for each item or factor by counting the number of experts who rated them as 3 or 4 and dividing the result by the total number of experts.²¹ Items with CVI and FVI ≥ 0.80 ²¹ were then submitted to EFA and CFA to assess structural validity. The researchers used principal axis factoring to run EFA on

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