

# Back Pain and Body Posture Evaluation Instrument for Adults: Expansion and Reproducibility

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## ■ ABSTRACT:

The aim of this study was to propose, validate, and test the reproducibility of an expanded version of the Back Pain and Body Posture Evaluation Instrument (BackPEI), originally designed to assess back pain in school-aged children, for use with adults. Five questions from the original BackPEI were replaced, resulting in the revised instrument (BackPEI-A) containing 20 questions. Three experts checked the content validity of the revised instrument, and the reproducibility was tested by trialing the questionnaire with 154 adults. The reproducibility data for the questions regarding pain intensity, analyzed using the Wilcoxon test and intraclass correlation coefficient (ICC), indicated that (a) there was no difference between the medians and (b) the answers were highly correlated, both for lower back ( $p = .574$ ) (ICC = 0.908) and cervical ( $p = .968$ ) (ICC = 0.865) pain. The reproducibility data for the remaining questions analyzed using the  $\kappa$  coefficient were classified as moderate ( $0.4 < \kappa \leq 0.6$ ) or very good ( $\kappa > 0.8$ ). It was concluded that the BackPEI-A is a reproducible, valid, and reliable instrument for use in the evaluation of back and neck pain and their associated risk factors. The instrument also facilitates the evaluation of postural habits in activities of daily living in adults.

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The number of individuals reporting the occurrence of lower back pain, neck pain, and postural alterations in the spine has increased (Fejer, Kyvik, & Hartvigsen, 2006; Ferreira et al., 2011), leading to personal, economic, and social costs (Rubin, 2007). Because the evolution of pain and postural alterations are often asymptomatic (Gore, 2001; Jarvik et al., 2005), these pain-related problems affect the performance of activities of daily living (ADLs) (Noll, Candotti,

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Tiggemann, Schoennel, & Vieira, 2012) and may, as in the case of back pain, lead to temporary disability (Cromie, Robertson, & Best, 2000).

Despite being the focus of various studies (Ferreira et al., 2011; Noll et al., 2012), lower back and neck pain are not fully understood because they involve multiple causal factors. In the literature, both pain and postural alteration have been related to risk factors such as gender, age, anthropometric parameters, spinal mobility, vertebral degeneration, profession, the practice of physical exercise, time spent in front of a computer, time sleeping, automobile accidents; and postural habits adopted in ADLs (Cromie et al., 2000; Ferreira et al., 2011; Marshall & Tuchin, 1996; Rubin, 2007). However, there is no consensus (Lee et al., 2015; Rubin, 2007) regarding these risk factors, which justifies investigating the risk factors associated with lower back pain, neck pain, and postural alterations in distinct populations.

Most epidemiologic studies that seek to investigate pain and its associated risk factors are based on the use of questionnaires. Among those available and validated, most are restricted to evaluating the presence of pain alone (Smith et al., 1997), functionality (Noll, Candotti, Vieira, & Loss, 2013), or postural habits in ADLs (Karahana & Bayraktar, 2004). As far as we know, the Back Pain and Body Posture Evaluation Instrument (BackPEI) is the only instrument designed

to jointly evaluate the presence of back pain and its associated risk factors (demographic, socioeconomic, genetic, behavioral, and postural) (Noll et al., 2013). However, the BackPEI was developed and validated exclusively to evaluate school-aged children (11-16 years of age) and does not consider pain in the cervical region of the spine. Therefore, the aim of this study was to propose, validate, and test the reproducibility of an expanded version of the BackPEI, which besides evaluating lower back pain also evaluates neck pain and can be used with adults. Such an instrument could be used in cross-sectional, epidemiologic, longitudinal, or observational studies that seek to identify the risk factors associated with pain.

## MATERIAL AND METHODS

The expanded version of the BackPEI for adults (BackPEI-A) was developed in six stages: (1) modification of the original questions; (2) exclusion of some of the original questions; (3) inclusion of new questions; (4) revision of the questionnaire by experts from the area and elaboration of the final version; (5) verification of the instrument's reproducibility; and (6) translation to English.

In attempting to identify the risk factors of lumbar and cervical pain in adults, in stages 1-3 the decision to retain, modify, exclude, or include questions from the

TABLE 1.

Description of Risk Factors Associated with Back and Neck Pain and the Reference Studies That Served As a Basis for Elaborating the Questions Contained in the Back Pain and Body Posture Evaluation Instrument for Adults (BackPEI-A) (Brazil, 2015)

Risk Factors	Questions	Reference Studies: Neck Pain	Reference Studies: Back Pain
Demographic	Age and gender	Fejer et al. (2006); Rubin (2007)	Rubin (2007)
Behavioral	Regularity of physical exercise and whether practiced competitively	Rubin (2007)	Rubin (2007)
	The number of hours spent per day watching television and using the computer	Smith, Louw, Crous, & Grimmer-Somers (2009)	Kanchanomai, Janwantanakul, Pensri, & Jiamjarasrangsri (2015)
	The number of hours spent sleeping and the habit of reading in bed	Paris (1990)	Edwards, Almeida, Klick, Haythornthwaite, & Smith (2008)
	Posture in relation to sleeping, sitting in a chair to write, sitting in a chair to talk, using a computer, and lifting an object from the ground	Karahana & Bayraktar (2004)	Balagué, Mannion, Pellisé, & Cedraschi (2012)
Socioeconomic	Involvement in a car accident	Marshall & Tuchin (1996)	—
	Type of school and schooling of the parents and/or responsible adults	Rubin (2007)	Rubin (2007)

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