



LITERATURE REVIEW

Photographic analysis of human posture: A literature review



José Luís Pimentel do Rosário, PhD*

State University of the Center-West – UNICENTRO, Rua Padre Salvador, 875, CEP 85015-430, Guarapuava, PR, Brazil¹

Received 15 February 2013; received in revised form 11 March 2013; accepted 16 April 2013

KEYWORDS

Assessment;
Photogrammetry;
Posture

Summary *Introduction:* The study of posture is not an easy task, mainly because postural assessment is still scientifically inaccurate. Photographs of bipedalism in the frontal and sagittal planes are one of the most widely used methods for this assessment. The aim of this literature review was to determine which anatomical markers authors of scientific papers have taken to minimize the chances of error in measurements.

Materials and methods: The Medline and Lilacs databases were searched for the period from 2002 to 2012, with the following keywords: “postura”; “posture” and “postural.”

Discussion: A number of studies have shown a reasonable correlation between radiographic measurements and the placement of markers. It appears possible to use photography as a form of scientific assessment since the anatomical landmarks are well chosen.

Conclusion: The markers that were suggested in this review: malleolus; posterior calcaneal tuberosity; fibular head; tibial tuberosity; greater trochanter of the femur; anterior angle and/or posterior lateral edge of the acromion; spinous processes (particularly C7); inferior angle of the scapula; sternum manubrium; mental protuberance; and the intertragic notch. Iliac spines, both anterior superior and posterior superior, should only be used with lean subjects.

© 2013 Elsevier Ltd. All rights reserved.

Introduction

The study of human posture is relatively new compared to other areas of medical science. Certain deviations in posture can be unsightly and can adversely affect muscular efficiency, as well as predisposing individuals to musculo-skeletal pathologic conditions (Liebenson, 2008; Wallden, 2009; Rosário et al., 2012). Posture can also alter or be

* Rua das Rosas 620, Mirandópolis, São Paulo CEP 04048-001, SP, Brazil. Tel.: +55 42 9992 9992.

E-mail address: ze.fisio@gmail.com.

¹ Tel.: +55 42 3621 1000.

altered by certain psychological conditions (James et al., 2009; Rosário et al., 2012). However, it is not an easy subject to study, mainly because postural assessments are still scientifically inaccurate. Two methods are widely used for such assessments: the study of the projection of the center of gravity with the aid of a force platform; and photography of the standing posture, using both frontal and sagittal planes (Rosário et al., 2012). Some methods, such as MRI, are expensive, while others, such as X-ray, involve radiation problems (Suzuki et al., 2010; Berthonnaud et al., 2009; Steffen et al., 2010).

The problem with the first approach is purely semantic. Some studies speak of postural analysis as measured by the force platform (Viguié et al., 2009), but this is inaccurate. The force platform measures the oscillation of the body and the association between the projection of the center of gravity and the support base (Bonde-Petersen, 1975), thus providing a balance, not a posture, measurement. Posture is strongly related to balance (Nashner, 1972; Nashner and McCollum, 1985). and its treatment can be similar, but posture is not the same as balance. It is very difficult to imagine a person with good posture and poor balance, but it is possible to imagine bad posture with good balance if the misaligned body segments are compensated so that the resulting projection of the center of gravity is between the feet.

The problem with the second approach is that the adhesive markers are not accurate. These are used in the demarcation of the features adopted as the reference point for calculating distances and angles on the photos (Rosário et al., 2012). Depending on the chosen anatomical region, it is easy to misplace the exact location. Large measurements, such as the distance between the shoulders for example, may not suffer so much with this error. However, smaller distances or angular measurements can be questioned since the displacement of the anatomical point may completely alter the outcome (Rosário et al., 2012).

Therefore, the aim of this literature review was to determine which methodologies have been adopted by authors of scientific works on posture, in order to solve or minimize this problem in photographic assessments, as well as to search for a protocol with less measurement errors which is easily reproducible, both for scientific and clinical objectives.

Materials and methods

Search methods

The Medline and Lilacs databases were consulted for relevant articles from 2002 to 2012 with the keywords "posture" and "postural". Articles needed to be in English, Portuguese, French, Italian or Spanish. Additionally, they needed to have a description of a photographic postural assessment.

Criteria for inclusion and exclusion

According to the objectives two main questions were addressed:

- 1 Is it possible to use photography scientifically to assess posture? Is there any strategy that minimizes the assessment errors?
- 2 What landmarks have been used to study posture?

In relation to the first question, articles that correlated the landmarks and other validated measurements, such as radiography or goniometry, were considered.

To answer the second question, all research articles that described the use of photography and landmarks were included.

Empirical research, letters to the editor and conference proceedings were excluded.

Study selection

For all research articles identified during the search, the titles, keywords and abstracts were read in order to confirm if they satisfied the inclusion criteria. Full text copies were obtained for analysis and data extraction for all articles that met the inclusion criteria.

Results

For the first question, 13 studies correlated the landmarks and other validated measurements, thereby satisfying the inclusion criteria.

Twelve research articles were found which used a landmark to assess posture through photographs.

No reviews or case studies were found.

Discussion

- 1 Validation of the photographic method for postural assessment

Before confirming which points are the most interesting for a photographic assessment, the obvious question is whether the photographic assessment is efficient to find postural deviations. Very few articles were found that validated or invalidated this type of assessment, despite the fact that a discussion of this work is of great importance in order to understand this tool.

A number of studies have reported a reasonable correlation between radiographic measurements and the placement of markers (Hunt et al., 2008; Mundermann et al., 2008; Vanwanseele et al., 2009). Certain authors look for methods to reduce the possibility of error in marking the bony landmarks and the correct placement of joint centers and axes (Bell et al., 1990; Camomilla et al., 2006; Ehrig et al., 2006, 2007; Taylor et al., 2005). Bland and Altman (1995), on the other hand, found some significant errors while correlating certain assessment methods. Smith et al. (2008) compared the alignment of the knee using photographs and X-ray and concluded that photographs are a viable tool for this purpose.

Iunes et al. (2009) studied twenty-one volunteers, who were visually assessed by three experienced physiotherapists and then photographed with markers attached to the skin at various anatomical sites. The photographs, in turn,

Download English Version:

<https://daneshyari.com/en/article/2619501>

Download Persian Version:

<https://daneshyari.com/article/2619501>

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