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Original article

Perceptions of sitting posture among members of the community, both with and without non-specific chronic low back pain

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ABSTRACT

Physiotherapists perceive upright, lordotic sitting postures to be important in the management of non-specific chronic low back pain (NSCLBP). Little is known about the perceptions of the wider community about seated posture, despite this being an important consideration before attempting to change seated posture. This study investigated perceptions of the best and worst sitting postures among members of the community, both with ($n = 120$) and without ($n = 235$) NSCLBP. Participants with NSCLBP perceived posture to be more important ($p < 0.001$), and reported thinking about their posture significantly more frequently ($p < 0.001$), than those without NSCLBP. 54% of participants selected a "neutral" lordotic sitting posture as their best posture, which was more frequent than any other posture ($p < 0.001$). Sitting postures which were "straight", and were perceived to keep the head, neck and shoulders in good alignment were preferred. However, what people considered "straight" varied considerably. 78% selected a slumped sitting posture as their worst posture, which was more frequent than any other posture ($p < 0.001$). The choice of best and worst sitting postures was not significantly influenced by gender, the presence of NSCLBP, or measures of pain, disability or back pain beliefs. Interestingly, a very upright sitting posture was the second most popular selection as both the best (19%) and worst (15%) posture. Overall, lordotic lumbar postures were strongly favoured among members of the community, which is broadly in line with the previously reported perceptions of physiotherapists.

1. Introduction

Non-specific chronic low back pain (NSCLBP) is a complex musculoskeletal disorder, with numerous contributing factors across the biopsychosocial spectrum (Moseley, 2007; Campbell and Edwards, 2009). Increased sitting duration does not increase the risk of developing NSCLBP (Roffey et al., 2010). In addition, a systematic review reported no evidence of a close relationship between sagittal spinal curvature and NSCLBP (Christensen and Hartvigsen, 2008). However, the quality of the available literature included in that review was described as "very low". Therefore, due to the reported aggravation of NSCLBP in sitting (Dankaerts et al., 2006), and the increased sitting time in modern society, physiotherapists commonly advise on sitting posture in the management of NSCLBP (Poitras et al., 2005).

Recent research has highlighted inconsistencies on what constitutes an optimal seated lumbar posture (Claus et al., 2009b; O'Sullivan et al., 2010). While reduced lumbar lordosis occurs during sitting (Scannell and McGill, 2003; Dunk et al., 2009; De Carvalho et al., 2010), a large degree of lumbar flexion in sitting is often suggested to be unhelpful (Williams et al., 1991). Sitting posture also varies with gender (Smith et al., 2010). Furthermore, people with NSCLBP appear to present with provocative sitting postures, which can be near either end-range flexion (kyphotic) or extension (lordotic) (Dankaerts et al., 2006).

Physiotherapists strongly favoured lordotic sitting postures in a recent study (O'Sullivan et al., 2012). The most commonly selected posture involved a relatively "neutral" sitting posture with moderate lumbar lordosis and a relaxed thorax (O'Sullivan et al., 2012). The physiotherapists highlighted the trade-off between proposed advantages of upright sitting postures such as supporting spinal structures and maintaining the "natural shape of the spine", and the costs in terms of increased muscular effort and spinal loading (O'Sullivan et al., 2006; Claus et al., 2009a). Differences also existed

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between the physiotherapists regarding the optimal degree of spinal extension in sitting.

No previous study has examined the perceptions of members of the community, either with or without NSCLBP, about sitting postures. This is notable considering perceptions about optimal sitting posture are likely to influence how people load their spine in daily seated tasks, consistent with existing models of health and illness behaviour (Leventhal et al., 2003) and evidence that other behaviours relevant to NSCLBP are consistent with beliefs about NSCLBP (Darlow et al., 2012). Before determining if, and how, spinal posture should be modified in people with NSCLBP, it is important to understand perceptions regarding spinal posture among members of the community. It was hypothesised that they would select lordotic sitting postures as optimal. However, it was unclear whether these would vary between those with and without NSCLBP, and between genders. Therefore, the primary aim of this study was to investigate the perceptions of members of the community on the best and worst sitting posture. A secondary aim was to examine whether these perceptions differed between people with and without NSCLBP.

2. Methods

2.1. Participants

355 (132M/223F) members of the community participated in this study, including 120 reporting NSCLBP (>three months duration) in the previous year and 235 control participants not reporting NSCLBP in the previous year.

2.2. Photographs of posture

Photographs of nine different sitting postures from a previous study (O'Sullivan et al., 2012) were used. Detail regarding the setup for these photographs has been published previously (O'Sullivan et al., 2012), such that only the main details are provided here. A 29 year-old female without NSCLBP was used as a model. While using both male and female models would be advantageous, attempting to re-create the exact same spinal angle in male and female models appeared to require very different degrees of effort on pilot testing. A digital camera (Panasonic Lumix TZ3) was positioned on a tripod 80 cm from the floor and 250 cm from the model, with the model facing perpendicular to the camera. Spinal markers placed overlying the spinous processes of C7, T12, L3 and S2 facilitated calculation of sagittal-plane angles for the thoracic (C7-T12-L3), lumbar (T12-L3-S2), and overall thoraco-lumbar (C7-T12-S2) regions using a LABVIEW programme. As such, these angles represent simple sagittal-plane spinal flexion, rather than forward tilt or lean of the trunk. The nine options included a range of postures observed in clinical practice between slumped and upright sitting, including some postures with varying cervical, thoracic and lumbar spine angles, as well as varying degrees of trunk lean. The postures were randomly numbered from one to nine, starting in the top left hand corner (Fig. 1). The model's face was obscured in each photograph. It was hypothesised that such a mix of postures would facilitate the participants having to prioritise their concepts of optimal sitting. For example, the most lordotic lumbar posture involved thoracic flexion along with relaxation of the neck and shoulders. The actual spinal angles associated with each posture are displayed in Table 1.

2.3. Data collection

Participants were recruited while attending for treatment at local pain medicine and physiotherapy clinics, while painfree control participants were recruited from within the local community through attending social and sporting events, and through word of mouth. After obtaining informed consent, participants viewed the nine photographs either electronically (colour format) or in paper format (A4 black and white). They were asked to view all nine postures, and then select both their perceived best and worst posture, justifying their selection with some comments on the relative advantages and disadvantages of the selected postures. The specific instruction was to "select the best posture for the spine as a whole, especially the lumbar spine". Participants were asked to

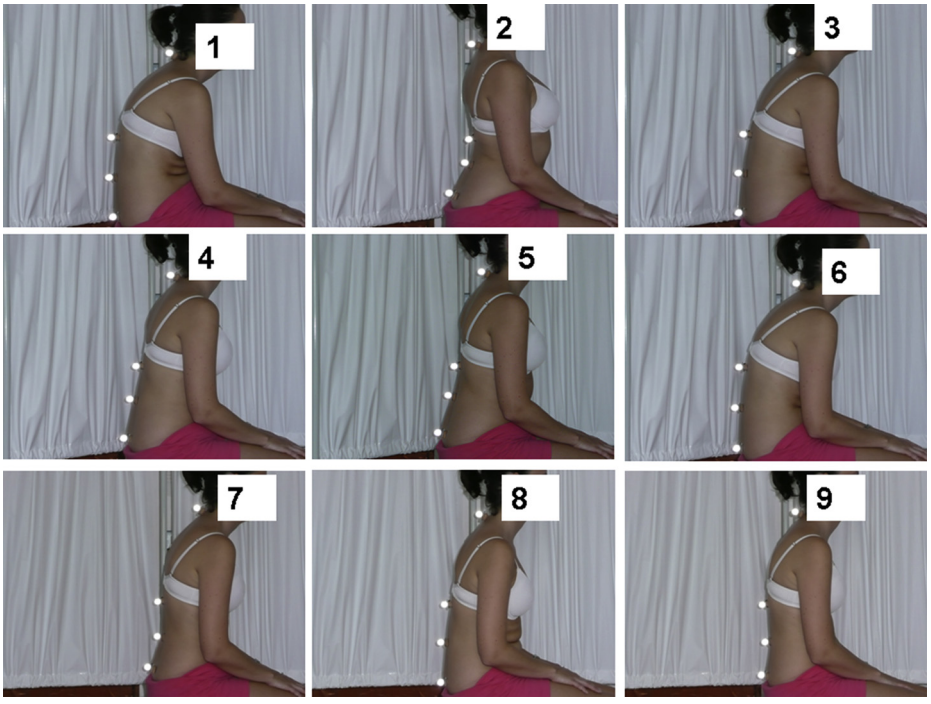

Fig. 1. The nine sitting posture options, numbered according to the descriptions in the main text.