

No Effect of Generalized Joint Hypermobility on Injury Risk in Elite Female Soccer Players: Letter to the Editor

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DOI: 10.1177/0363546518773715

Dear Editor:

We congratulate Blokland et al² on their study titled “No Effect of Generalized Joint Hypermobility on Injury Risk in Elite Female Soccer Players: A Prospective Cohort Study.” The study utilized a rigorous prospective design in terms of assessment protocol, clearly defined outcomes, and statistical analysis around the dropouts.

This study reports that the prevalence of generalized joint hypermobility (GJH) in elite female soccer players was 17.5% at a Beighton cutoff ≥ 4 and 11.4% at a cutoff ≥ 5 . As the authors point out, young age, female sex, and non-Caucasian ethnicity are associated with higher prevalence of GJH. The participants in this study were postpubertal females, and ethnicity was not reported. Given that the prevalence of GJH in a healthy female population of this age group⁵ is 10.0% at a Beighton cutoff ≥ 4 and 6.0% at a cutoff ≥ 5 and that soccer is not a sport where GJH is advantageous,¹ the prevalence reported in the Blokland et al study is likely to be a significant overestimation.

The study employed the Beighton scoring system as the only measure of GJH. We propose that it was not an optimal choice for a number of reasons. First, the Beighton score has not been validated for use to identify GJH in adults. Second, demonstrating the lack of face validity of the Beighton score in this context is that most injuries in this cohort were knee and ankle sprains. Ligamentous injury of these joints is most commonly attributed to motion in the coronal and transverse planes. The Beighton score does not test for joint hypermobility in the horizontal and coronal planes of the knee and does not assess the ankle joint. Last, that GJH was not found to be a risk factor for injuries in these elite female soccer players may be due to the fact that the Beighton score identifies hypermobility mostly in the upper limb while the injuries occurred in the lower limb.

We contest that the Beighton score is not a valid determinant of GJH in this soccer cohort, where lower limb injuries are most common. Therefore, a region-specific tool, such as the 12-item Lower Limb Assessment Score,³ would reflect a more accurate representation of GJH and the association with injury. From both a clinical and a research perspective, we contest that the Lower Limb Assessment Score is a more useful and accurate tool to identify lower limb-specific hypermobility and GJH, having been validated in pediatric³ and adult populations.⁴

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The authors declared that they have no conflicts of interest in the authorship and publication of this contribution.

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No Effect of Generalized Joint Hypermobility on Injury Risk in Elite Female Soccer Players: Response

DOI: 10.1177/0363546518773721



Authors' Response:

We read with great interest the letter to the editor from Nicholson and Chan, including their vision on measuring generalized joint hypermobility (GJH) of the lower extremity. We thank the authors for their valuable contribution. They contest the Beighton score that we used to measure GJH in our prospective cohort study on injuries and risk factors in elite female soccer players.¹ Because injuries of the lower extremity are most frequently reported in soccer players,⁴ they advise the use of a more region-specific tool to measure GJH.

In March 2017, a systematic review by Juul-Kristensen and colleagues⁵ was published regarding measurement properties of clinical assessment methods for classifying GJH. They found 4 assessment procedures (Beighton score, Carter and Wilkinson, Hospital del Mar, Rotes-Querol) and 2 questionnaires (5-part questionnaire, Beighton score

[self-reported]) that are used to classify GJH in children as well as adults. In total, 33 studies were included that reported on the clinimetric properties of these assessments. Only a few of these studies cited the reliability and validity of the Carter and Wilkinson (n = 1), Hospital del Mar (n = 1), and Rotes-Querol (n = 2); therefore, no conclusions could be drawn. Most studies were reported on the reliability and validity of the Beighton score and the 5-part questionnaire. Conflicting evidence was found for the reliability of the 5-part questionnaire, and studies on the validity of this questionnaire showed methodological issues. Although shortcomings were found in studies reporting on the validity of the Beighton score as well, the interrater reliability was categorized as acceptable to be used in clinical practice, provided that uniformity of the testing procedures is included in these measurements. In our prospective cohort study of elite female soccer players, the Beighton score was assessed by 1 person, a sports physician with extensive experience in performing this test. In the 2014-2015 soccer season, when our study was performed, the Beighton score was still the reference standard used in clinical practice and in epidemiologic studies.

A number of studies were recently published that reported on the clinimetric properties of physical assessments for measuring GJH.^{7,8} One of these studies concerned the 12-item Lower Limb Assessment Score (LLAS),⁷ as mentioned in the letter by Nicholson and Chan. Hypermobility may be located all over the body in the case of GJH; therefore, the LLAS was designed to study GJH of the lower extremity of adults. However, the LLAS was originally designed for a pediatric population³ and was not validated for an adult population until 2017.⁷

We encourage development and validation of clinical assessments tools such as the LLAS, which concentrates on hypermobility of the lower extremity. Consequently, the LLAS tests multiple lower limb joints, whereas the Beighton score just includes a single lower extremity joint in its testing procedure. However, we assume that in cases of a positive Beighton score, more joints than those examined will probably show increased mobility owing to, among others factors, a genetic component. On the other hand, since lower extremity injuries are the most predominantly reported injuries for athletes such as soccer players⁴ and runners⁶, the LLAS may give better insight of GJH in this population.²

Nevertheless, when we started our study of female soccer players in 2014, the LLAS was not yet validated as a screening tool for GJH in adults. Therefore, we also assessed the individual item “knee hyperextension” of the Beighton score in relation to knee injury incidence, knowing that knee injuries are most frequently reported for

female soccer players. We found that knee hyperextension had no significant effect on the incidence of knee injuries in female soccer players.

Without a doubt, further development and research on measurement properties of assessments for GJH, including physical procedures as the Beighton score or the LLAS, are necessary to make the next step in this area and to make assessment of GJH more accurate and valid.

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This letter has been updated from its original version in order to remove a redundant sentence.

The authors declared that they have no conflicts of interest in the authorship and publication of this contribution.

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