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Short communication

# Body perception in a sample of nonclinical youngsters with joint hypermobility

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ABSTRACT

*Background:* Participants with Joint Hypermobility Syndrome (JHS) often suffer from anxiety, stress related illnesses and also from dysautonomia. The autonomic nervous system (ANS) is hypothesized to play a key role in the relationship between these variables. However, to date, no studies have assessed body awareness and the reactivity of autonomically-regulated organs in JHS using the Body Perception Questionnaire.
*Method:* A cross sectional study including 117 nonclinical youngsters (mean age 16.96 ± 0.87 years old) assessed JHS in relation to body perception. JHS screening was done using the self-reported Screening Questionnaire for Collagen condition and Hypermobility assessment (SQCH) and body perception was assessed using the Spanish version of the Body Perception Questionnaire (BPQ).
*Results:* The JHS was found in 33.3% of the sample and it was significantly higher in females ($\chi^2 = 12.15$; $p = < .001$). Participants with JHS had higher scores in body awareness ($p = .012$), stress response ($p = .007$), ANS reactivity ($p = .01$), and in the health history inventory ($p = < .001$). In this last subscale, higher frequency of anxiety ($p = <.001$), unhappiness ($p = <.001$), depression ($p = <.001$), bulimia ($p = .012$), anorexia ($p = .023$), eczema ($p = .003$), and severe menstrual cramps (in females only) ($p = .016$) were found among the JHS participants. Moreover, JHS participants made significantly more visits to mental health professionals ($p = .019$) than their non JHS counterparts.
*Conclusions:* Participants with JHS have a body perception profile characterized by higher body awareness and stress response and greater ANS reactivity. These participants also have higher frequency of anxiety, depression, bulimia, anorexia, unhappiness, severe menstrual cramps (in females only) and eczema. These findings support the hypothesis that the ANS and body perception may play a key role in the development of anxiety and somatic illnesses among participants with JHS, but this needs to be further evaluated in subsequent studies.

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## Percepción corporal en una muestra de jóvenes no clínicos con hipermovilidad articular

*Palabras clave:*
Hipermovilidad articular
Ansiedad

RESUMEN

*Antecedentes:* Las personas con síndrome de hipermovilidad articular (SHA) padecen a menudo ansiedad, estrés relacionado con la enfermedad y también disautonomía. Se ha conjeturado que el sistema nervioso

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Percepción corporal
Disfunción del sistema nervioso autónomo

autónomo juega un papel clave en la relación entre estas variables, pero hasta la fecha ningún estudio ha evaluado la conciencia corporal y la reactividad de los órganos regulados autonómicamente en el SHA utilizando el cuestionario de imagen corporal.

*Método:* Estudio transversal que incluyó a 117 jóvenes no clínicos (edad media 16,96 ± 0,87 años) en quienes se valoró el SHA en relación con la imagen corporal. Se realizó un cribado de SHA utilizando el cuestionario autoinformado de cribado para la valoración del estado de colágeno e hipermovilidad (SQCH), evaluándose la percepción corporal mediante la versión española del cuestionario de imagen corporal (BPQ).

*Resultados:* Se encontró SHA en el 33,3% de la muestra, siendo significativamente superior en las mujeres ($\chi^2 = 12{,}15$; $p \leq 0{,}001$). Las personas con SHA reflejaron mayores puntuaciones en cuanto a conciencia del cuerpo ($p = 0{,}012$), respuesta al estrés ($p = 0{,}007$), reactividad del sistema nervioso autónomo ($p = 0{,}01$) e inventario de antecedentes de salud ($p \leq 0{,}001$). En esta última subescala se encontró una mayor frecuencia de ansiedad ($p \leq 0{,}001$), infelicidad ($p \leq 0{,}001$), depresión ($p \leq 0{,}001$), bulimia ($p = 0{,}012$), anorexia ($p = 0{,}023$), eccema ($p = 0{,}003$) y dolores menstruales severos (solo en mujeres) ($p = 0{,}016$) entre las personas con SHA. Además, las personas con SHA realizaron un número de visitas considerablemente superior a los profesionales sanitarios ($p = 0{,}019$) que los participantes sin SHA.

*Conclusiones:* Las personas con SHA tienen un perfil de percepción corporal caracterizado por una mayor conciencia sobre el cuerpo y una reactividad superior del sistema nervioso autónomo. Estos participantes también poseen una mayor frecuencia de ansiedad, depresión, bulimia, anorexia, infelicidad, dolores menstruales severos y eccema. Estos hallazgos respaldan la hipótesis de que el sistema nervioso autónomo y la imagen corporal pueden jugar un papel principal en el desarrollo de la ansiedad y las enfermedades somáticas entre las personas con SHA, aunque esto debe evaluarse en mayor profundidad en estudios futuros.

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## Introduction

The term Joint Hypermobility Syndrome (JHS) is characterized by increased distensibility of the joints in passive movements as well as a hypermobility in active movements along with several extra articular symptoms. The literature shows that JHS is closely associated with anxiety disorders and this correlation constitutes a specific phenotype for a homogeneous type of anxiety in adults and in the elderly (Bulbena-Cabré et al., 2016, 2017; Bulbena, Pailhez, Bulbena-Cabre, Mallorqui-Bague, & Baeza-Velasco, 2015). Specifically, JHS has been associated with higher frequency and intensity of fears and greater severity of anxiety, higher somatic complaints and higher frequency of the so-called endogenous anxiety disorders (panic, agoraphobia and social phobia) (Bulbena, Gago, Sperry, & Berge, 2006; Bulbena-Cabré et al., 2016). Moreover, participants with JHS frequently present with stress-sensitive illnesses such as fibromyalgia, irritable bowel disease, temporomandibular joint disorder and chronic fatigue syndrome (Grahame, 2008).

While the association between anxiety disorders and JHS is well established, the underlying mechanisms are still unclear. Some biological hypotheses have been proposed to explain this association including genetic risks, interceptive sensitivity, somatosensory amplification, emotion processing variances, and autonomic nervous system dysfunction. In the area of genetics, one study found a cytogenetic anomaly (DUP-25) common to these two phenomena (Gratacòs et al., 2001), although to date this study has not been replicated (Henrichsen et al., 2004; Tabiner et al., 2003). The perception and interpretation of physiological excitation plays a role in anxiety disorders (Craig, 2003; Damasio, Everitt, & Bishop, 1996) and JHS participants have more intense interoception (Mallorqui-Bague et al., 2014) and somatosensory amplification (Baeza-Velasco, Gely-Nargeot, Bulbena-Vilarrasa, & Bravo, 2011). Neuroimaging studies (Eccles et al., 2012; Mallorqui-Bague et al., 2014) have shown significant emotion processing differences in JHS, which could in part explain the vulnerability for anxiety and other somatic symptoms.

Another important biological hypothesis is the autonomic nervous system dysfunction. Dysautonomia have symptoms that overlap with anxiety and JHS. Critchley, Eccles, and Garfinkel (2013) extensively studied visceral inputs because of their influence on thoughts, feelings and behavior. Consistent Chritchley's views, the Polyvagal Theory (Porges, 1995, 2011) introduced a new perspective relating autonomic function to behavior that included an appreciation of autonomic nervous system as a "system," the identification of neural circuits involved in the regulation of autonomic state that also influence responses to environmental stimuli and an interpretation of autonomic reactivity as adaptive within the context of the phylogeny of the vertebrate autonomic nervous system. Following this line of research, Porges developed the Body Perception Questionnaire (BPQ), an instrument to assess subjective experiences of body awareness and autonomic reactivity (Porges, 1993). Compared to other scales that measure subjective experiences of body perception, the BPQ was developed with a foundation in the peripheral neural pathways that transmit bodily sensations to the brain, which provides valuable information about the reactivity of autonomically-regulated organs. The BPQ has been used in several peer review studies to obtain objective reports of bodily reactions and states (Critchley, Wiens, Rothstein, & Dolan, 2004; Mehling et al., 2009) but to date this instrument has not been used in JHS research.

## Method

In this study, we evaluated a sample of nonclinical youngsters to assess JHS in relation to the level of awareness of body processes, the subjective experience of autonomic nervous system reactivity, and the frequency of autonomic related illnesses. This cross-sectional study was conducted in a high school in Barcelona (Spain) and a total of 117 participants (33 males (28.2%) and 84 females (71.7%) with ages ranging from 16 to 18 y/o were included in the study. All incoming students were eligible to participate and no exclusion criteria were applied. Participation was voluntary without any economic compensation and informed consent was obtained from participants after the study procedures were fully explained.

Socio-demographic data was obtained through a socio-demographic questionnaire (including visits to Psychiatrist/Psychologist). The mean age was 16.96 (SD ± 0.87) years old

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