

Social Anxiety Disorder and Joint Hypermobility: Lack of Association in a Sample of Brazilian University Students

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Abstract

Anxiety is associated with a number of other medical conditions, among which is joint hypermobility. This association is more consistent in panic disorder, and further evidence is necessary in regard to other anxiety disorders. This study investigated the association between Social Anxiety Disorder (SAD) and joint hypermobility in a sample of Brazilian university students. Data were collected from a convenience sample of 87 participants, divided into SAD cases (n=39) and non-cases (n=48). Participants were selected according to their social anxiety score in the brief version of the Social Phobia Inventory (Mini-SPIN) and SAD diagnosis was confirmed with Module F of the Structured Clinical Interview for DSM-IV (SCID-IV). The volunteers completed a screening questionnaire for joint hypermobility (the five-part questionnaire for identifying hypermobility) and underwent an individual physical examination based on the Beighton score. The prevalence of joint hypermobility as assessed using a Beighton score ≥ 4 was of 41% in SAD cases and 37.5% in non-cases. No significant differences were observed between the two groups ($\chi^2=0.112$ p=0.73). The group of SAD cases had slightly higher Beighton scores, although the difference from non-cases did not reach statistical significance. Our findings do not point to the existence of an association between SAD and joint hypermobility in this sample of Brazilian university students. This result adds to the discussion on the specificities of different anxiety disorders and ethnic features that might mediate the association between anxiety and joint hypermobility.

Keywords: Anxiety; Social phobia; Joint hypermobility; Beighton score; University students

Introduction

Anxiety is commonly associated with many other clinical conditions [1-4], which poses an interesting challenge for researchers and clinicians as such associations may be related both to shared biological features among clinical conditions as well as to the effects of being ill and having to deal with chronic pain or extended treatments [5]. One of the conditions found to be associated with anxiety is joint hypermobility.

Anxiety and joint hypermobility are known to have some features in common, including early age of onset, higher prevalence in females, lower pain threshold, autonomic alterations, and somatic sensitivity [6].

Social Anxiety Disorder (SAD) is one of the most prevalent anxiety disorders [7-9], although it is frequently undiagnosed [10]. Broadly, SAD manifests through excessive fear of been evaluated and/or criticized by others, especially in social situations or performance tasks [11].

Joint hypermobility is characterized by increased joint mobility beyond what is usually expected and is generally regarded as a benign manifestation, and not a disorder [12,13]. However, some authors advocate that hypermobility should be considered as part of a spectrum [13,14] that ranges from harmless hypermobile features to complex clinical conditions requiring specialized attention. When other symptoms such as arthralgia and injuries, and non-articular symptoms are present in addition to hypermobility, we have a clinical condition known as Joint Hypermobility Syndrome (JHS) [12,13,15]. Joint hypermobility syndrome has also been included among the heritable disorders of connective tissue and is considered the same clinical condition classified as Ehlers-Danlos type III (EDS_{III}) in rheumatological field [13].

The most widely used method to assess joint hypermobility is Beighton score, but there is no consensus regarding the best cut-off

point to be used [13]. In general and historically, a score of four from a list of nine positive signs is accepted as the threshold suggesting joint hypermobility. Still today, however, researchers are searching for better criteria that take into account age, ethnic, and gender differences [16]. As an alternative for the assessment of joint hypermobility, Hakim and Grahame [17] proposed a self-rating questionnaire comprising five questions. This instrument can be used as a screening instrument for joint hypermobility and precluded the need for physical examination.

Studies that evaluate the association between anxiety and joint hypermobility can be divided into two main groups: general population surveys [18-24] and assessments of clinical samples consisting of groups diagnosed with anxiety disorders [25-33].

In samples diagnosed with anxiety disorders the association with joint hypermobility seems to vary according to the type of disorder. The association is more consistent with panic disorder with or without agoraphobia [25,27], followed by SAD and simple phobia, about which further evidence is necessary. Other anxiety disorders such as obsessive-compulsive disorder and generalized anxiety disorder do not seem to be associated with joint hypermobility [34].





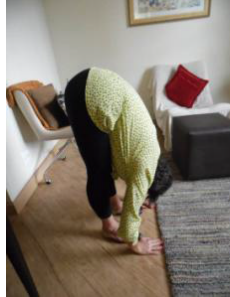
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Figure 1: The nine-point Beighton hypermobility score (Beighton, 1973).

Ability to:	Right	Left	
(1) Passively dorsiflex the fifth metacarpophalangeal joint to $\geq 90^\circ$	1	1	
(2) Oppose the thumb to the volar aspect of the ipsilateral forearm	1	1	
(3) Hyperextend the elbow to $\geq 10^\circ$	1	1	
(4) Hyperextend the knee to $\geq 10^\circ$	1	1	
(5) Place hands flat on the floor without bending the knees	1		
Total score	9		
Score: one point may be gained for each side for manoeuvres 1-4, so that the hypermobility score will have total of nine points if all are positive.			

Since the association between SAD and joint hypermobility is not yet clear, we did this exploratory study to compare two groups of Brazilian university students, one with and another without SAD, in respect to joint hypermobility evaluation.

Method

Data collection

This study is part of a broader research project that aims to evaluate several aspects of anxiety among 2300 Brazilian university students [35]. To define this convenience sample, participants were selected according to their social anxiety score in the brief version of the Social Phobia Inventory (Mini-SPIN) and SAD diagnosis was confirmed with Module F of the Structured Clinical Interview for DSM-IV (SCID-IV). These criteria allowed us to work with two groups, divided according to the presence or absence of SAD, as described below.

Cases of SAD: participants who scored ≥ 6 in the Mini SPIN [36,37] and were diagnosed with SAD using module F of the SCID [38].

Non-cases of SAD: participants who scored ≤ 2 in the Mini SPIN [36,37] and were not diagnosed with SAD [38].

Participants completed a screening questionnaire for joint hypermobility (the five-part questionnaire for identifying hypermobility) and underwent an individual physical examination based on the Beighton score.

Self administered instruments

- Socio-demographic questionnaire: Protocol specifically designed for the study to record identification data.

- Social Phobia Inventory (SPIN): Social Phobia Inventory (SPIN): Created by Connor et al. [39] to evaluate symptoms of SAD based on DSM-IV criteria and validated to Brazilian Portuguese by Osório et al. [40,41]. The SPIN has 17 items rated on a four-point Likert scale. A brief version (Mini SPIN) includes three items of the original scale (6, 9, and 15) that shown to have high sensitivity and discriminative power for the diagnosis and screening of SAD (Connor et al. [42]). The brief version was validated in Brazil by Osório et al. [36,37]

- The five-part questionnaire for identifying hypermobility: Developed by Hakim and Grahame [17], this self-rating instrument is commonly used as a screening tool for JHM. The questionnaire was translated and validated to Brazilian Portuguese by Moraes et al. [43] and presented good psychometric properties. For a cut-off point ≥ 2 , the questionnaire had a sensitivity of 70.9 % (62.1-78.6; 95% CI), specificity of 77.4 % (71.4-82.6), positive predictive value of 63.4% and negative predictive value of 82.8%.

Clinical evaluation

Structured Clinical Interview for DSM-IV (SCID-IV): The SCID was created by First et al. [38] for clinical psychiatric diagnoses based on DSM-IV criteria and was translated and adapted to Brazilian Portuguese by Del-Ben et al. [44]. A senior clinical psychologist administered the SCID to all participants.

The Beighton score of joint hypermobility. The subjects underwent individual physical examinations based on the Beighton score [15] by an experienced rheumatologist in a private room. Hypermobility score will have a total of nine points if all items are positive. We used a cut-off of ≥ 4 to indicate joint hypermobility. The rheumatologist used a goniometer during the physical examination, a standard instrument

that allows measures of joint range angles. The medical examiner was blind to the participants' ratings of the self-administered rating scales used and to the psychiatric diagnosis made in the study.

Statistical analysis

The data were analyzed using parametrics and non-parametrics in SPSS (version 15.0). The characteristics of the sample were analyzed with descriptive statistics. Comparisons between groups were made using chi-square, Fisher's and Mann-Whitney's tests, with the significance level set at $p < 0.05$.

Results

Sociodemographics characteristics

The final sample comprised 87 university students, 39 cases of SAD and 48 no-cases of SAD. There were no significant differences between groups in terms of gender, age, ethnicity, marital status, occupation, academic achievement (mean grades), area of study, stage in university course, use of psychotropic drugs, and socioeconomic status.

Social anxiety disorder patients

Concerning the clinical features of SAD cases (N=39), we found that most participants (97%) had not been diagnosed with the disorder despite presenting anxiety symptoms for many years (median age of onset of 7 years and median time of 12 years dealing with symptoms). There was a predominance of the non-generalized subtype of SAD (59%), with moderate symptom severity. Among symptoms, the fear of public speaking was the most frequent in this group (85%). The group of SAD cases included participants with psychiatric comorbidities (as assessed with the SCID-IV), the most frequent of which was major depression. See Table 1.

Joint hypermobility prevalence

According to the Beighton score (cut-off point ≥ 4), 41% of SAD cases and 37.5% of non-cases were classified as hypermobile. No significant differences were found between the two groups ($\chi^2 = 0.112$; $p = 0.73$). Overall, joint laxity was more frequent on women than men ($\chi^2 = 18.81$; $p < 0.001$). The group of SAD cases had slightly higher Beighton scores, although the difference from non-cases was not statistically significant, as shown in Table 1.

Discussion

In general, our data show no differences between SAD cases and non-cases regarding the association between SAD and joint hypermobility. The existing literature is inconclusive concerning this association. Bulbena et al. [19,21] did find an association between SAD and joint hypermobility and described indicators of higher relative risk of social phobia as well as increased fear [20,21] in hypermobile samples using Beighton score, which suggests vulnerability to phobias. On the other hand, no significant associations were found between joint hypermobility syndrome diagnosed by Brighton criteria (cited), and social anxiety assessed with the Liebowitz Anxiety Scale in a study with French university students [23]. This is in line with our finding in a similar sample, although generalization is limited due to the use of different assessment instruments. Among the French students, however, authors point out gender differences, having hypermobile male students more social anxiety than women.

Divergence in literature regarding the association between anxiety and hypermobility is also found in respect to other anxiety disorders.

Table 1: Characteristics of the sample: socio demographics, social anxiety and joint hypermobility.

		SAD cases N = 39		Non-cases SAD N = 48		Statistics
		N (%)	Mean (SD) Median	N (%)	Mean (SD) Median	
Gender	Male Female	14 (36) 25 (64)		21 (44) 27 (56)		p = 0.30 ^(a)
Age			21.82 (4.9) 21		21.17 (2.9) 20.5	U=-861.00 p= 0.51
Ethnicity	White Brown/Black Asian	28 (72) 06 (15) 05 (13)		39 (81) 08 (17) 01 (02)		$\chi^2= 3.869$ p=0.14
Marital status	Single Married/ stable	19 (49) 20 (51)		15 (31) 33 (69)		$\chi^2= 2.758$ p=0.09
Occupation	Study and work Study	02 (05) 37 (95)		03 (06) 45 (94)		p = 0.59 ^(a)
School grade			71.3 (13.2) 70.3		69.4 (12.8) 69.3	U=851.00 p= 0.71
Area of study	Exact Human Biological	16 (41) 02 (05) 21 (54)		17 (35) 04 (08) 27 (56)		$\chi^2= 0.522$ p=0.77
Study stage in university	First half Second half	28 (72) 11 (28)		35 (73) 13 (27)		p = 0.55 ^(a)
Psychotropic Use	Yes No	02 (05) 37 (95)		01 (02) 47 (98)		p = 0.42 ^(a)
Socioeconomic Status	A+B C +D	26 (67) 13 (33)		34 (71) 14 (29)		p = 0.34 ^(a)
SAD subtype	Generalized Non-generalized	16 (41) 23 (59)				
SAD severity	Mild Moderate Severe	08 (20) 27 (69) 04 (10)				
Types of fear (not exclusive)	Speaking Eating Writing Other	33 (85) 09 (23) 04 (10) 21 (54)				
Age of onset			10 (3.8) 07			
Comorbidity	Major depression Simple phobia Generalized Anxiety Alcohol abuse Dysthymia Panic disorder Post-traumatic stress	14 (36) 09 (23) 02 (05) 02 (05) 01 (03) 01 (03) 01 (03)				
Beighton \geq 4 cut-off		16 (41)		18 (37.5)		$\chi^2=0.112$ p=0.73
Beighton Score			2.92 (2.65) 03		2.85 (2.34) 02	U=723.00 p= 0.32

SAD= Social Anxiety Disorder

^(a): Fisher Test, χ^2 : Chi square, U: Mann-Whitney, SD: standard deviation

For example, the association between panic disorder and joint hypermobility has been consistently described [25,27,33], although some studies have also reported the absence of significant differences between hypermobile and non-hypermobile samples [28,31].

Taken together, our data and the results of previous studies raise questions about the specificities of different anxiety symptoms and methodological issues, such as the type of anxiety assessed by the instruments used in each investigation. This means that the association between anxiety and hypermobility has been described for specific contexts or particular types of anxiety, but not others. Therefore, specificities of anxiety types could play a role in the association with

joint hypermobility; for example, data indicate that the association exists in regard to trait anxiety, but not state anxiety [18,23].

Among the limits of our study, we should highlight the small sample size, which enhances the importance that this data should be replicated in a larger sample or a replication study. It is also very important to mention that the non-inclusion of the Brighton criteria to assess joint hypermobility syndrome or Villefranche nosology [45] to describe other clinical symptoms of EDS-III, such as joint dislocation, pain or skin hyperextensibility is also a limitation of our study. Moreover, it is relevant to stress the differences among joint hypermobility and the joint hypermobility syndrome, especially because Beighton

score is specific centered in the musculoskeletal condition of joint laxity and classify subjects by the presence/absence of a predisposing constitutional factor, whereas the syndrome also includes the presence of non-articular symptoms, such as autonomic symptoms that can play a role as a confounding factor when assessing anxiety disorders [12].

Conversely, it is important to highlight the methodological value of the use of a physical examination for joint hypermobility in addition to the screening questionnaire. Besides that, strength of our study was the fact that Beighton score was assessed in all participants by the same senior rheumatologist researcher. In the same direction, the goniometer use of indicates an extra care to increase methodological features. In regard to anxiety assessment, we highlight the use of a validated structured interview instrument to establish SAD diagnosis.

Finally, is possible that ethnic features should be taken into account in interpreting the lack of significant differences between the two groups assessed here. To our knowledge, this is the first study to assess the association between anxiety and joint hypermobility in a Brazilian sample. According to data presented, our sample consisted mainly of white participants, but it is important to remember that the Brazilian population is known by its race miscegenation [46,47] and even among white Brazilians there is a high possibility of ethnic diversity, which may have contributed to the high prevalence of joint hypermobility in both groups and interfered with results concerning its association with anxiety.

Future studies should look at broader aspects of the possible association between SAD and joint hypermobility, including other variables that might play a role in this relationship, especially pain. Objectively, future research could investigate the existence of the association between anxiety and joint hypermobility in samples fulfilling criteria for joint hypermobility syndrome, therefore expanding the range of signs and symptoms that could be implicated in this association.

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Conflict of interest

The authors state that there were no conflicts of interest directly relevant to the content of the study.

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