

## FEMININITY CONTRIBUTION TO PAIN EXPERIENCE: AN EXPLORATORY CROSS-SECTIONAL STUDY AMONG UNDERGRADUATES

### CONTRIBUIÇÃO DA FEMINILIDADE NA DOR: ESTUDO TRANSVERSAL EXPLORATÓRIO ENTRE UNIVERSITÁRIAS

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**ABSTRACT:** Pain is multidimensional in its nature, so its perception includes sensory, emotional, social and symbolic aspects. The present study aimed to determine the prevalence of painful symptoms among dental students and to verify their association with self-reported femininity. This is a cross-sectional study in two public dentistry universities in Recife, Pernambuco. The sample comprised 387 female undergraduate students between 21 and 24 years old. Data collected included socio-demographic characteristics, number of painful sites (McGill Pain questionnaire), pain intensity (VAS), and need to communicate pain. Femininity was assessed using the Traditional Femininity and Masculinity (TMF-s) scale, recently developed to identify central facets of self-attributed masculinity-femininity. Pearson's chi-square test and binary logistic regression were performed to analyze differences regarding the degree of femininity and pain characteristics. The results showed that the regions with the highest frequency of pain were head (56%), spine (50%), shoulder (43%) and face (35%). Participants with greater femininity score reported more painful body regions. Back pain, pain in more than three body sites, and need to communicate pain were significantly associated with greater femininity. Cultural and psychosocial aspects related to pain experience and communication should be considered in the analysis of gender differences within a biological same-sex group.

*Keywords:* Femininity; Musculoskeletal pain; Pain communication; Gender

**RESUMO:** Sendo a dor multidimensional, sua percepção contempla os aspectos sensoriais, emocionais, sociais e simbólicos. O presente estudo teve como objetivo determinar a prevalência de sintomas dolorosos entre estudantes de odontologia e verificar sua associação com o autorrelato de feminilidade. Trata-se de um estudo transversal em duas universidades públicas de Odontologia em Recife, Pernambuco. A amostra compreendeu 387 estudantes de graduação do sexo feminino entre 21 e 24 anos. Os dados coletados incluíram características sociodemográficas, quantidade de locais dolorosos (questionário McGill Pain), intensidade da dor (EVA) e necessidade de comunicar a dor. A feminilidade foi avaliada através da escala Tradicional Feminilidade e Masculinidade (TMF-s), recentemente desenvolvida para identificar facetas centrais da masculinidade-feminilidade autoatribuídas. O teste do qui-quadrado de Pearson e a regressão logística binária foram realizados

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para analisar diferenças em relação ao grau de feminilidade e às características da dor. Os resultados obtidos apontaram que as regiões com maior frequência de dor foram cabeça (56%), coluna (50%), ombro (43%) e face (35%). As participantes com maior escore de feminilidade relataram mais regiões corporais dolorosas. Dor na coluna, dor em mais de três locais do corpo e necessidade de comunicar a dor foram significativamente associados à maior feminilidade. Aspectos culturais e psicossociais relacionados à experiência e comunicação da dor devem ser considerados na análise de diferenças de gênero dentro de um grupo de mesmo sexo biológico.

*Palavras-Chave:* Feminilidade; Dor musculoesquelética; Comunicação da dor; Sexo

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Population-based studies and literature reviews have shown that pain is more prevalent in females (Del Giorno et al., 2017; Fayaz et al., 2016; Harker et al., 2012; Van Hecke et al., 2013). The mechanisms by which sex relates to pain has been a topic of great clinical interest in recent decades (Fillingim et al., 2009). Recently, attention is directed toward the identification of existing sex conditions and how these differences can alter clinical control of pain (Greenspan et al., 2007).

The terms "sex" and "gender" refer to two distinct but related factors. Sex encompasses a set of biological attributes, such as chromosomes, genetic expression and anatomical aspects, and gender is related to a complex trait, being dependent on psychological, social, cultural and political factors and defined as a sociocultural construction of roles, norms, behaviors, identities and authority relations (Kray et al., 2017; Marmot et al., 2008.). Despite this distinction and relevance, in the analysis of sociodemographic data, most studies include only the "sex" variable (Fillingim et al., 2009)

In pain, sex may be related to different biological mechanisms (Pieretti et al., 2016) (Bartley & Palit, 2016). Gender influence is associated with emotional, cognitive, behavioral or social role differences that has been previously described (Dworkin et al., 1990). Sex may also interact with gender. When investigating gender roles and their relationship to pressure pain, a significant correlation between masculinity-femininity and pain threshold was observed for men but not for female participants (Eltumi & Tashani, 2017). Femininity is a set of attributes, behaviors, and roles generally associated with girls and women. Femininity is socially constructed, but made up of both socially defined and biologically generated factors (Tsirigotis, 2018) This makes it distinct from the definition of the biological female sex, as both males and females can exhibit feminine traits (World Health Organization, 2014). In clinical pain, higher femininity seems to be associated with a greater number of areas with pain and a greater use of health services (Fillingim et al., 1999).

Several risk factors might be associated with the high prevalence of musculoskeletal disorders in dental professionals and dental students. These are probably due to recurrent and repetitive movements, prolonged working hours in static positions without sufficient breaks and incorrect work postures (Botta et al., 2018; Vijay & Ide, 2016). Although some sex-specific differences in health outcomes are caused by biological factors, many others seems to be socially driven through gender norms (Farber et al., 2012). This cross-sectional study analyzed the impact of self-reported femininity in painful complaints, among female undergraduates. The hypothesis to be tested is that higher femininity contributes to more painful symptoms and need to communicate pain.

## METHODS

This study aimed to investigate: (1) the prevalence of painful complaints in female undergraduate students, (2) the association between femininity and painful complaints.

### *Participants*

This cross-sectional study was reported using the “Strengthening the Reporting of Observational studies in Epidemiology (STROBE)” guidelines (Vandenbroucke et al., 2014). This is a non-probabilistic sample of 387 female undergraduates. Participants were included in the study if they clearly indicated their biological sex as female (i.e., participants who described themselves as male or transgendered were excluded from the study). The study was conducted according to the guidelines of the Declaration of Helsinki, (General Assembly of the World Medical Association, 2014) and was completely anonymous. The study protocol was evaluated for Ethical Committee approval at University of Pernambuco, Recife, n° 83717617.7.0000.5207. Information on study protocol were given, and informed consent was obtained, before administration of an anonymous questionnaire.

### *Measures*

All variables were collected through a questionnaire, divided into sections. The first one included socio demographic characteristics: biological sex, age and sexual orientation.

Pain variables were measured by questions about location (pain site) through the McGill Pain Questionnaire (MPQ). The MPQ is a comprehensive multidimensional questionnaire that quantifies neurophysiologic as well as psychological domains of pain (Varoli & Pedrazzi, 2006). On a drawing of the human body with both anterior and posterior sides, participants indicated their painful body sites. Pain location was divided into six main categories, corresponding to the MPQ: head, neck, shoulder, back, arms, wrists, lower extremity, with an open line for additionally sites. The students were asked to indicate all pain locations over the past three months. One marked area corresponded to one pain site. Three or more ( $\geq 3$ ) pain sites were categorized in pain in more than three sites. Facial pain was measured by adding the first question of 3Q/TMD questionnaire: ‘Do you have pain in your temple, face, jaw, or jaw joint once a week or more?’ The responses options were “yes” or “no”(Lövgren et al., 2016; Lövgren et al., 2018). Reliability for this question was adequate (Cronbach’s  $\alpha = 0.785$ ).

Pain intensity in the last month was measured with the visual analogue scale (VAS). The pain VAS is a one-dimensional measure of pain intensity, which has been widely used in diverse adult populations, including those with rheumatic diseases (Wolfe et al., 2010). The pain VAS is a continuous scale comprised of a horizontal (HVAS) or vertical (VVAS) line, usually 10 centimeters (100 mm) in length, anchored by 2 verbal descriptors, one for each symptom extreme (Chiarotto et al., 2019). The scale was anchored by “no pain” (score of 0) and “pain as bad as it could be” or “worst imaginable pain” (score of 10). Using a ruler, the score was determined by measuring the distance (mm) on the 10-cm line between the “no pain” anchor on the patient’s mark, providing a range of scores from 0 –10. A higher score indicates greater pain intensity. The need to communicate pain comprised three possible answers (no/sometimes/yes).

Femininity was assessed through the Traditional Femininity and Masculinity scale (TMF-s), recently developed to identify central facets of self-ascribed masculinity-femininity. This scale comprises questions regarding gender identity and gender roles. The first item (*I consider myself as...*) asked participants to indicate their self-described levels of masculinity and femininity. The item is scored on a 7-point Likert scale ranging from very masculine to every feminine, which is similar to other techniques used for measuring gender expression (Kachel, Steffens, & Niedlich, 2016; Vigil, Rowell, & Lutz, 2014). The internal validity in cross-cultural adaptation for the self-reported femininity question was high (Cronbach’s  $\alpha = 0.97$ ). For analysis purposes, only female participants with scores 5, 6 and 7 were included and categorized in: “a little bit feminine”, “feminine” and “very feminine”, respectively.

### *Statistical Analysis*

Descriptive analyses were carried out by calculating the frequencies and percentages for the categorical variables, while continuous variables were summarized as the mean ( $\pm SD$ ). Prevalence was calculated with a 95% CI. Pearson’s chi-square test was conducted to analyze group differences regarding femininity level and frequency of pain locations, multisite pain, pain intensity, and need to communicate pain. The probability of high femininity (“very feminine” group) and pain perception was predicted using binary logistic regression, with the pain parameters that had association in the bivariate model. The significance level was set at  $P \leq .05$ . There were three outliers with VAS equal 10 in the “feminine” group. They were excluded from analyses to avoid overestimated VAS scores. Statistical analyses were conducted with SPSS for Windows software version 22 (IBM).

## RESULTS

The demographic characteristics of respondents are shown in Table 1. In total, 387 female dental students (76%) responded the questionnaires. The majority of respondents were heterosexual (93%), in the age range of 21 to 24 years old (56%), and self-reported being very feminine (58%). Only six respondents scored from neutral to a little bit masculine (scores 3 and 4).

**Table 1.** Demographic characteristics of female dental students of public universities in Recife- PE ( $n=387$ ).

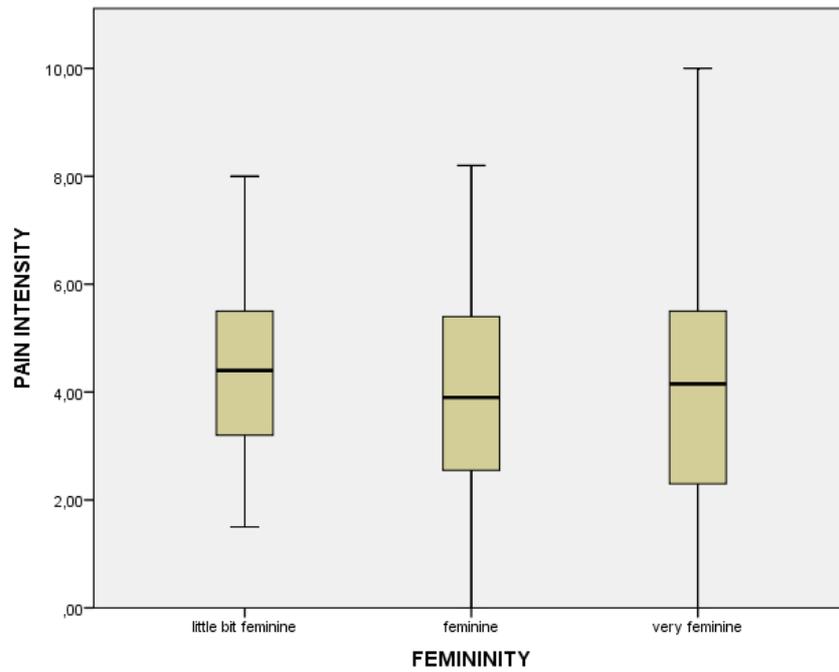
Variables	Categories	<i>n</i>	%
Age (years)	17 -20	114	29
	21 - 24	216	56
	> 25	57	15
Sexual orientation	Heterosexual	362	93
	Homosexual	11	3
	Bisexual	14	4
Femininity level	Little feminine	61	16
	Feminine	94	25
	Very feminine	214	58

**Table 2.** Pain sites distribution, pain intensity and need to communicate pain of female dentistry undergraduates students of public universities in Recife- PE ( $n=387$ ).

Pain sites	<i>n</i>	%
Head	218	56
Back	193	50
Shoulder	168	43
Facial	135	35
Neck	113	29
Knee	59	15
Wrist	35	9
Hip	21	5
Pain > 3 sites	203	56
Need to communicate pain	85	22

**Note:** Values in percentage column were rounded for better reading.

The mean VAS for pain intensity was 4.09 ( $SD= 2.06$ ), while the median was 4.3 (minimum = 0.0; maximum = 10.0) (Figure 1). It was observed that the mean VAS were very similar between femininity groups. Although not statistically significant, the “very feminine” group had the higher scores for pain intensity ( $p = 0.136$ ).



**Figure 1.** Box plot of pain intensity according to self-reported femininity.

The most frequent body regions participants indicated pain were: head (56%), back pain (50%), shoulder (43%) and face (35%). Hips were the least frequent (5%). Most of the participants had pain in more than three sites (56%). Regarding pain communication, 22% reported need to communicate their pain. The distribution of pain in other body regions is presented in Table 2.

Table 3 shows the association between pain regions and levels of femininity. Being “very feminine” was associated with back pain ( $P = 0.044$ ), with pain in more than three sites ( $P = 0.016$ ) and need to communicate pain ( $P = 0.013$ ).

**Table 3.** Association between femininity and pain symptoms among female dental students ( $n=387$ ).

Pain sites and characteristics	A little bit feminine		Feminine		Very feminine		df	Chi-square value 2	P-value*
	n	%	n	%	n	%			
Head	35	15	61	26	139	59	2	4.327	0.534
Back	22	36	47	50	116	54	2	6.263	<b>0.044*</b>
Shoulder	27	17	43	26	92	57	2	3.945	0.139
Facial	19	15	32	25	78	60	2	0.630	0.729
Neck	18	17	28	26	61	57	2	1.423	0.491
Knee	10	18	16	29	29	53	2	0.919	0.631
Wrist	8	25	9	28	15	47	2	2.299	0.306
Hips	3	14	5	24	21	6	2	0.131	0.927
Pain > 3 sites	24	12	45	19	195	81	4	10.313	<b>0.016*</b>
Need to communicate pain	6	7	19	24	55	69	2	8.591	<b>0.013*</b>

**Note:** \*Pearson’s chi-square test significance (2-tailed), df: chi-square test degree of freedom.

In the “very feminine” group, participants had a 2.09-times higher probability of having back pain (odds ratio [OR] = 2.09; 95% confidence interval [CI] = 1.16 to 3.77;  $P = 0.047$ ). Also, a 2.32-times higher probability of having pain in more than three sites (odds ratio [OR] = 2.32, 95% confidence

interval [CI] = 1.29 to 4.18;  $P = 0.018$ ); and a 3.65-times higher probability of communicating pain to others (odds ratio [OR] = 3.65; 95% confidence interval [CI] = 1.16 to 3.77;  $P = 0.018$ ) (Table 4).

**Table 4.** Prevalence ratio (OR) for the association between femininity and back pain, pain > 3 sites and need to communicate pain ( $n=348$ ).

Variable	Prevalence ratio	
	OR	CI (95%)
<b>Back pain</b>		
No	1	
Yes	2.09	(1.16 – 3.77)
		<b>0.047</b>
<b>Pain &gt; 3 sites</b>		
No	1	
Yes	2.32	(1.29 – 4.18)
		<b>0.018</b>
<b>Need to communicate pain</b>		
Sometimes	1	
Yes	3.65	(1.46 – 9.07)
		<b>0.018</b>

**Note:** \*Binary logistic regression model (95% CI).

## DISCUSSION

The results show that the most prevalent sites of pain reported by female dental students were head, back and shoulder. The prevalence of headache in Brazil is similar to the findings in the present study, and it seems to be frequent in this population (Bhat et al., 2016; Queiroz & Silva Junior, 2015). In Brazil, the most common types of headache are tension-type, migraine and chronic daily headache. For females, this complaint can also be related to the use of contraceptives or menstrual cycle (Dzoljic et al., 2002; Queiroz & Silva Junior, 2015). The present study showed higher prevalence for back pain and shoulder pain. In a systematic review, the prevalence of general musculoskeletal pain among dentists ranges between 64% and 93%. The most prevalent regions for pain in dentists have been shown to be the back and neck (Hayes et al., 2009). Dental students deal with incorrect position of the body along their training (Samoladas et al., 2018). Additionally, they deal with high levels of concentration, including static and awkward posture in the upper body.

Most of female dental students in our research self-reported higher femininity, which is expected (Kachel et al., 2016). Since the 1970s, gender roles have been studied through the BSRI (Bem Sex role Inventory), especially in college students. It has been observed that the attributes used for gender identification no longer correspond to current cultural patterns (Hernandez, 2009). Such findings indicate that gender stereotypes may be based on some sort of “core” masculinity and femininity. Similarly, individuals may use such “core” masculinity and femininity in their self-identification.

Regarding the significant association between higher femininity and need to communicate pain, these findings are consistent with a social-role theory, which emphasizes the causal impact of gender roles beliefs about the behavior that is appropriate for each sex. The more women have femininity, they are more warm, altruistic, submissive, risk-averse, tender minded, emotionally unstable, and open to feelings and aesthetic experiences (Del Giudice, 2015). In a study to investigate the Gender Role Expectations of Pain questionnaire (GREP), results support some hypotheses about gender role: both men and women participants rated men as less willing to report pain than women; both men and women participants rated women more sensitive and less enduring of pain than men (Robinson et al., 2001).

The above-mentioned may also be an explanation for the association between higher femininity and complaints of back pain and pain in more than three sites. In a previous study, within-sex variability in femininity was associated with experimental pain performance. Compared with heterosexual women, lesbian and bisexual women reported lower pain intensity ratings early in the discomfort task. Irrespective of sexual orientation, attraction to more feminine romantic partners and dispositional masculinity were correlated with lower pain intensity, and with higher pain thresholds and tolerance levels. (Vigil et al., 2014). In clinical pain, higher femininity may also contribute to pain experience.

The current study highlights the potential importance of cultural aspects of gender for understanding sex differences in clinical pain sensitivity and pain communication. A focus on sex and gender differences can provide a useful contextual focus that will help explain why there are individual differences in pain experience (Vierhaus et al., 2011). More fundamentally, such approach also highlights the need to consider the wider context in which pain occurs, and that individual differences as gender reflects wider social-cultural attitudes and expectations on pain expression, perception and care.

There are some limitations to this study. Since it is a cross sectional research among undergraduate students as subjects, limits the generalizability of the findings. However, to the best of our knowledge, this is the first study evaluating within-gender differences in clinical pain, making this project very relevant to clarify factors related to biological differences, differences in socialization, pain coping and gender roles. Future research investigating gender in this population needs to evaluate other aspects related to pain and compare to a larger sample of both sexes.

In conclusion, compared to participants with less femininity, higher feminine participants had higher frequencies of self-reported painful body regions. Back pain, pain in more than three sites and need to communicate pain were significantly associated with higher femininity. Cultural and psychosocial aspects related to pain experience and communication should be considered in the analysis of gender differences within a biological same-sex group.

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Mauricio Kosminsky: Conceptualization, Acquisition of financing, Investigation, Methodology, Supervision, Writing – revision and edition

Michele Nascimento: Data curation, Investigation, Methodology, Project administration

Maria Izabel Ribeiro: Validation, Visualization, Writing – original draft

Jair Carneiro Leão: Conceptualization, Formal Analysis, Acquisition of financing, Resources, Supervision

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