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RESEARCH ARTICLE

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ON THE MEANING OF PAIN – GUILT IN CHRONIC SUFFERERS: DOES PAIN MEAN PUNISHMENT?

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ABSTRACT

Introduction: The meaning of the word “pain” has an intrinsic component of punishment, penalty, sanction, suffering and torment. **Objective:** To investigate if pain is perceived by chronic pain patients as a punishment and thus associated with a feeling of guilt. For that purpose, an inventory to detect and quantify guilt was applied to subjects with chronic pain, to individuals with chronic tinnitus and to healthy controls, and results were compared. **Method:** Through a cross-sectional study (n=136) pain and tinnitus groups were evaluated with validated scales regarding the intensity of pain and tinnitus, and the three groups regarding levels of anxiety, depression, guilt and religiousness. **Results:** Anxiety and depression levels were the same between groups chronic pain versus chronic tinnitus ($p = 0.790$; $p = 0.938$), but different between groups chronic pain versus healthy controls ($p < 0.001$) and chronic tinnitus versus healthy controls ($p < 0.001$). Guilty feelings showed no differences between group chronic pain versus chronic tinnitus ($p = 0.155$) and chronic pain versus healthy controls ($p = 0.065$), though they were greater for group chronic tinnitus as compared with healthy controls ($p = 0.004$). Religiosity indexes were not different among groups. **Conclusion:** The study demonstrated that chronic pain was not associated with feelings of guilt and thus, at least nowadays and in the population studied, dissociated of the meaning of punishment.

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INTRODUCTION

For the International Association for the Study of Pain (IASP), pain is an unpleasant sensory and emotional experience associated with or related to actual or potential tissue injury. The physiological mechanisms of pain are linked to concepts of peripheral sensitization and neuroplasticity in the perpetuation of pain through the action of biochemical mediators in nociceptive pathways. Thus, they can establish a correlation between inflammation, pain and psychological systems (Merskey 1994; Osborne, N. R., Anastakis, D. J. and Davis, K. D. 2018; Sheng, J., Liu, S., Wang, Y., Cui, R. and Zhang, X. (2017) Lopez-Lopez, D., Vilar-Fernandez, J.M., Calvo-Lobo, C., Losa-Iglesias, et.al., 2017; Stotz, S.J., Elbert, T., Muller, V., Schauer, M., 2015.). The word pain has an intrinsic meaning of punishment, which can be related to feelings of guilt (Herbert, Malaktaris, Lyons, Norman, 2020). In English, the origin of the word fault refers to words defining crime, guilt, or the expression to pay a debt.

Primitively painful punishment was a method formerly used to heal the feeling of guilt through a negative – non-rewarding – physical and psychological experience (Lewis, Short, Freud, 1981). The limited research on guilt and pain dates back 1950, where oriented accounts suggested that experiencing pain can represent an attempt to assuage guilt related to feelings of responsibility (Engel, 1962). In modern research, guilt has been shown to manifest among patients with chronic pain who fear their pain may negatively impact family members (Lumley et al., 2011; Serbic and Pincus, 2013; Snelgrove et al., 2013). Previous studies have indicated that patients with chronic pain have higher guilt scores when compared to healthy controls (Tangney, Stuewing, Mashek, 2007; Turner-Cobb, Michalaki, Osborn, 2015; Giummarra, M. J., Baker, K. S., Ioannou, L., Gwini, S. M., et al. 2017; Aquino, Medeiros, 2009). Another aspect to consider is that a painful sensation may lead to emotional distress which can act as a modulator that either amplifies or inhibits the severity and/or the chronicity of pain (Porreca, F. and Navratilova, E. 2017., Aquino, Medeiros, 2009; Menezes, Moreira, Brandão, 2010). Thus, the

objective of this study was to test the hypothesis that patients with chronic pain present significantly higher scores of guilt.

POPULATION AND METHODS

This was an observational, cross-sectional study conducted in the municipality of Curitiba, Brazil, from July 2015 to July 2017. The study was approved by the local regulatory committee, and all participants signed an informed consent statement. Subjects were recruited for three groups: those with chronic pain (CP), those with chronic tinnitus (CT), and healthy controls (HC). Participants were randomly selected from a pain clinic, from a tinnitus clinic, and among blood donors at the Hospital de Clínicas of the Federal University of Paraná, Brazil, respectively. The tinnitus population was chosen as an active control considering that pain is a positive, chronic, and subjective sensation.

Eligibility Criteria: Inclusion criteria considered individuals of both sexes, aged between 18 and 65 years who showed sound comprehension of questions, and agreed to participate by signing an informed consent statement. To be included, individuals with chronic pain also had to present pain symptoms for six months or more (chronic pain) at an intensity of 4 points or more in the visual analogue scale (VAS), and pain should be caused by a single condition. If other clinical conditions were present, they should not be related to pain and/or should not be able to potentiate it (e.g. arterial hypertension). For the chronic tinnitus group, this should be the most important clinical condition. The group of healthy individuals should have no significant symptoms or medical conditions. Exclusion criteria for the three groups were: presence of another major psychiatric condition other than anxiety or depression; request to be withdrawn from the study; incomplete study scales.

Population of the Study: A total of 151 individuals were evaluated, 15 of whom were excluded for not fully completing the study questionnaires, resulting in a final sample of 136 subjects. Women were 73.5% (n = 101) of the population and mean age was 51.1 years. Groups were matched by age and sex. Demographic and nosological characteristics of the study population are available in Tables 1 and 2.

Study Procedures: The Guilt Scale, a 12-item Likert-type scale, was applied to score guilt. This scale encompasses three domains: 1) subjective guilt (SG), measuring the feelings of guilt, remorse, shame, or self-condemnation; 2) objective guilt (OG), measuring the feelings of guilt that occurs when the law is broken; and 3) temporal guilt (TG), which measures the time spent with this condition. To analyze the score of this instrument, a transformed scale was developed to quantify guilt in absolute values, so different domains were analyzed separately. Each domain was considered in its total score and transformed into a scale of 0% to 100%. In this case, the minimum possible score for a given domain was subtracted from the score of the patient, divided by the range of the score, and multiplied by 100, as follows: $[(\text{patient score} - \text{minimum score}) / \text{range of the score}] \times 100$. The scale was applied by professionals trained for such procedure (Aquino, Medeiros, 2009). Intensities of chronic pain and chronic tinnitus were measured through VAS, where 0 indicated no pain or tinnitus, while 10 was the worst perceived pain or worst tinnitus intensity.

This scale was also applied by professionals trained for such procedure (SBED, 2028; Azevedo, Oliveira, Siqueira, Figueiredo, 2007). To exclude confounding factors, we also observed the presence of religious and psychiatric comorbidities. For religious attitudes the Religiousness/Spirituality Scale was used, but instead of conducting a factorial analysis of the results, the total scores of patients were inserted according to the formula: $[(\text{patient score} - \text{minimum score}) / \text{range of the score}] \times 100$ (Aquino, 2009). Among the evaluations used was the Mini International Neuropsychiatric Interview (MINI), which aims to identify the existence of diagnoses in patients. After applying the MINI, participants responded the Beck questionnaire for anxiety and depression in order to quantify the

intensity of depressive and anxiety symptoms. The Beck inventories for anxiety and depression are composed of 21 items each, with graded levels for each symptom evaluated, in which anxiety and/or depression is rated as: minimum, for values from 0 to 10; light, from 11 to 19; moderate, from 20 to 30; and severe, from 31 to 63 (Roland, Fairbank, 2000; Sheehan et al, 1998; Beck, Ward, Mendelson, Mock, Ergaugh, 1961; Beck, Rush, Shawm Emery, 1997). These scales were applied by psychiatrists trained for such procedure. It should be noted that patients diagnosed with depression and/or anxiety that were still untreated, were referred to the HC-UFPR Psychiatric Outpatient Clinic for treatment and adequate follow-up of their conditions.

Statistical analysis: Results of quantitative variables were described by means, medians, minimum values, maximum values and standard deviations. Qualitative variables were described as frequencies and percentages. Comparisons of quantitative variables between two and among three groups were conducted using the Mann-Whitney and Kruskal-Wallis tests, respectively. For categorical variables, either Fisher's exact test or the Chi-square test, corrected by Bonferroni, were used. The level of significance adopted was 0.05, with $p < .017$ when corrected by Bonferroni. For all analyses, the IBM SPSS.2.0 Statistics program was used (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp.).

RESULTS

Of the total sample analyzed with 136 patients, 52 of these presented chronic pain with mean pain intensity of 8.0 ± 1 , while the chronic tinnitus group consisted of 24 patients with mean pain intensity of 7.8 ± 1.8 . Regarding the chronic pain group, no significant differences were detected for pain intensity by sex, age or duration of the painful condition. The scores of depression, anxiety and total guilt are described in Table 3. Comparisons among the chronic pain group, chronic tinnitus group and controls showed no significant difference regarding the subjective guilt (SG) and objective guilt (OG) subcategories. In turn, the temporal guilt (TG) category presented a significant difference between patients with chronic tinnitus, who had significantly higher guilt scores, and the healthy controls ($p = .014$) (Table 4). As expected, results obtained using MINI revealed that depression was more prevalent in subjects with chronic pain when compared to healthy controls ($p < .001$). The same was found for subjects with chronic tinnitus ($p = .002$). Anxiety was significantly more diagnosed in subjects with chronic pain and chronic tinnitus than among healthy controls ($p < .001$), and similar to depression, anxiety scores were not related to those of guilt. In all groups, religious practices were very frequent, and no significant difference was detected between religiousness and feelings of guilt in the groups studied (Table 5).

DISCUSSION

This study aimed to evaluate if pain is perceived by chronic pain patients as a punishment and thus associated with a feeling of guilt. It was found that individuals with chronic pain were found lesser feelings of guilt when compared to both healthy individuals and individuals with chronic tinnitus. An unexpected result of this study was the finding that individuals with chronic tinnitus felt more guilt than those with chronic pain, in comparison to healthy controls. Guilt for disease-related loss of time prevailed among subjects with chronic pain, while feelings of remorse, self-condemnation and/or punishment were frequent for chronic tinnitus individuals. The association between symptoms of anxiety and depression in study groups was also assessed. A higher prevalence of depression was found in a group of individuals with chronic pain, whereas a higher prevalence of anxiety was observed in patients with chronic tinnitus when comparing two chronic situations with economic control. The association between religiosity indexes were not different among groups. Guilt is often misunderstood and confused with other emotions, mainly with shame. Therefore, researchers try to distinguish those two emotions.

Table 1. Demographic profile of the study groups population

	Chronic Pain (n= 52)	Chronic Tinnitus (n= 24)	Healthy Controls (n= 60)	p		
Age y + s.d.	50.5 ± 9.7	52.3 ± 8.9	50.5 + 9.5	0.691 a		
Gender	n	%	n	%		
Female	38	73.1	17	70.8	0.832 b	
Male	14	26.9	7	29.2	14	23.3

Legend: y: mean age in years; s.d.: standard deviation; n: number; p: significance; %: percentage; a: Kruskal-Wallis parametric test; b: Chi-square test.

Table 2. Underlying conditions of chronic pain and tinnitus subjects

Chronic Pain	n= 52	Chronic Tinnitus	n= 24
Condition *	n	%	Condition n %
Complex regional pain I & II	29	55.7	Otosclerosis 20 87.5
Rheumatic disease	20	38.4	Unknown 4 21.1
Cancer	17	32.7	
Diabetic neuropathy	36	69.2	
Myofascial pain	31	59.6	
Fibromyalgia	15	28.8	

Legend: n: number of individuals in the group; n: number; %: percentage; *: some individuals had more than one pain condition; Rheumatic disease: arthrosis, ankylosing spondylitis, tendinitis, bursitis.

Table 3. Distribution of the depression and anxiety scores among the three groups

	CP n= 52	CT n= 24	HC n= 60	CP versus CT p	CP versus HC p	CT versus HC p
Depression	n (%)	n (%)	n (%)			
Absent to minimum	26 (50.0)	14 (58.3)	55 (91.7)	0.790	<0.001	
Light to moderate	11 (21.2)	4 (16.7)	4 (6.7)			<0.001
Moderate to Severe	15 (28.8)	6 (25.0)	1 (1.7)			
Anxiety	n (%)	n (%)	n (%)	p	p	p
Absent to minimum	16 (30.8)	8 (33.3)	59 (98.3)	0.938	<0.001	<0.001
Light to moderate	21 (40.4)	10 (41.7)	1 (1.7)			
Moderate to Severe	15 (28.8)	6 (25.0)	0 (0.0)			

Table 4. Distribution of the score total of guilt between groups

Total Guilt	CP n= 52	CT n= 24	HC n= 60	CP versus CT p	CP versus HC p	CT versus HC p
	n (%)	n (%)	n (%)			
Absent	16 (30.8)	2 (8.3)	18 (30.0)	0.155	0.065	0.004*
Light	16 (30.8)	8 (33.3)	30 (50.0)			
Moderate	17 (5.8)	11 (45.8)	8 (13.3)			
Severe	3 (5.8)	3 (12.5)	4 (6.7)			

Legend: CP: Chronic Pain; CT: Chronic Tinnitus; HC: Healthy Controls n: number of individuals in the group. a-Chi-square test, p < .017, Bonferroni correction. Source: The author (2017)

Table 5. Association between the intensity of chronic pain and chronic tinnitus, with factors of guilt and religious attitude

Subjective Guilt	n	ICP	±s.d.	p	Subjective Guilt	n	ICT	±s.d.	p
1	20	8.0	1.1	0.567	1	4	6.8	1.3	00.576
2	16	8.1	1.1		2	7	8.0	2.2	
3	12	7.8	0.9		3	9	7.1	2.0	
4	4	8.5	1.0		4	4	7.8	0.5	
Objective Guilt	n	ICP	±s.d.	p	Objective Guilt	n	ICT	±s.d.	p
1	23	8.0	0.9	0.990	1	6	6.7	2.1	00.519
2	19	8.2	1.3		2	11	8.1	1.4	
3	7	8.1	1.1		3	3	7.7	2.5	
4	3	7.7	0.6		4	4	6.5	1.3	
Temporal Guilt	n	ICP	±s.d.	p	Temporal Guilt	n	ICT	±s.d.	p
1	19	7.9	1.1	0.789	1	4	8.5	1.3	00.423
2	13	7.9	0.9		2	7	6.6	2.1	
3	12	8.2	0.9		3	7	7.4	1.9	
4	8	8.4	1.2		4	6	7.7	1.4	
Total Guilt	n	ICP	±s.d.	p	Total Guilt	n	ICT	±s.d.	p
1	16	8.0	1.1	0.645	1	2	8.5	2.1	-
2	16	7.9	1.0		2	8	6.8	2.1	
3	17	8.3	1.1		3	11	8.1	1.4	
4	3	7.7	0.6		4	3	6.0	1.0	
Religious Attitude	n	ICP	±s.d.	p	Religious Attitude	n	ICT	±s.d.	p
1	4	8.0	1.4	0.452	1	2	6.0	1.4	-
2	15	7.7	1.0		2	3	7.3	2.1	
3	21	8.3	1.1		3	8	8.1	1.6	
4	12	8.0	1.0		4	11	6.9	1.9	

Legend: s.d: standard deviation; n: number; ICP: Intensity Chronic Pain; ICT: Intensity Chronic Tinnitus.
* No statistical tests were included. - The test was not applied due to the number of cases.

From a literature review, understand shame as an experience resulting from a public transgression, and the feeling of guilt is always a remembered feeling of unpleasant or "painful" traits, which can be felt both consciously and unconsciously (Koening, 2004; Hudson, 1996, Taghinejad, Suhrahi, Kikhavani, Jaafarpour, Azadi, 2014; Lima GM, Alentar HM, 2020). The literature does not provide comparative studies, but a cross-sectional study of 287 patients with chronic low back pain found that individuals who were most satisfied with their pain condition were those with less anxiety, depression and guilt. Among other conclusions, the authors considered that guilt can be a potential target for therapeutic interventions based on the acceptance of pain (Serbic, Pincus 2017). Another study with a focus on guilt explored the prevalence and experience of self-conscious emotions (SCE) – shame, guilt, humiliation, embarrassment – in patients with chronic pain in comparison to controls and assessed the relationship between SCE and secondary disorders to pain²³. The findings highlight the prevalence of negative SCE and their importance in the evaluation and management of chronic pain (Serbic, Pincus, 2014).

Similar to chronic pain, with which they are often comorbid, anxiety and depression are persistent mental disorders of great impact in quality of life (Serbic, Pincus, 2014; Gellis, Hamud, 2011). Confirming previous studies in the literature, the chronic pain group presented higher depression scores when compared to normal controls. Curiously, anxiety was more present and intense in the chronic tinnitus group than in the chronic pain group and normal controls. In subjects with chronic pain, anxiety scores also outweighed healthy controls. A previous study regarding tinnitus detected depression in 17.4% of subjects, with slightly higher prevalence in women (9.8%) than in men (7.6%). On the other hand, anxiety (22.8%) was slightly more prevalent in men (11.9%) than in women (10.9%) (Sniezekm Siddiqui, 2013). A recent study on 157 tinnitus subjects found probable anxiety in 25% of participants and probable depression in 27% (Adoga, Adoga, Obindo, 2008). Another study among 108 people with tinnitus found anxiety prevalence to be 35%, while depression was 13% (Craske et al, 2017) These latter results are closer to our findings, which were considerably higher than previous studies (Bhatt JM, Bhattacharyya N, Lin HW. (2017); Pattyn T, Van Den Eede F, Vanneste S, et al. (2016); Li, Y., Wang, M. X., Zhou, J. and Zhou, H. F. (2019). The higher prevalence of anxiety found in the present study may be related to differences in population, clinical conditions, methods, and cultural and/or environmental features. Some authors emphasize the importance of approaches in the affective sphere of patients with chronic pain, so that they deal with feelings such as guilt. One study suggests that acceptance of pain and their condition is one way to address the "beyond-control" aspect of chronic pain (Edwards, R. R., Dworkin, R. H., Sullivan, M. D., Turk, D. C. and Wasan, A. D. (2016); Sheng, J., Liu, S., Wang, Y., Cui, R. and Zhang, X. 2017).

The same author considers that the process of acceptance of pain is not intended to reduce guilt. Rather, it involves learning to live fully among all the various emotional and cognitive reactions in the experience of pain. Moreover, the acceptance of pain is associated with decreased anxiety, depression and, potentially, guilt (Anderson, Kaldo-Sandstrom, Strom, Strongren, 2003; Serbic, Pincus, Fife-Schaw, Dawson, 2016). Guilt itself may be a risk factor for poor treatment outcomes, and this study supports anxiety, depression, and guilt to be considered as targets in the treatment of chronic pain patients. Therefore, our results support the argument that approaches focused on coping with guilt related to chronic pain, which refers to the loss of time in daily activities, and coping with guilt related to chronic tinnitus, which is expressed by remorse, self-condemnation and punishment, should be considered in the treatment of both conditions, respectively (Serbic, Pincus, 2014). Although the sensation of pain is considered as associated with punishment – following the symbolic meanings included in the expression "culpa" in the definitions of Latin and Anglo-Saxon cultures – individuals with pain only reported more pronounced subjective guilt than normal controls, but not than individuals with chronic tinnitus. In addition, in the population studied, pain was not associated with subjective guilt, indicating that it was not perceived as punishment. Therefore, the

findings of this controlled study suggest that it is a mistake to relate the term "pain" to an intrinsic feeling of punishment, at least for the population studied. The limitations of this study regard the sample used. There is evidence that guilt may be qualitatively different in different cultures and, as with all self-reporting measures, there is the possibility of social bias.

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