

Somatic, Affective, and Pain Characteristics of Chronic TMD Patients with Sexual Versus Physical Abuse Histories

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Aims: *This study examined whether temporomandibular disorder (TMD) patients with sexual versus physical abuse histories differ in their pain report, psychological distress, and somatic symptoms.* **Methods:** *Participants were 114 female TMD patients. The sample was divided into 3 groups based on abuse history: sexual abuse, physical abuse, or no abuse. Abuse histories were assessed with a structured clinical interview. Measures used included the McGill Pain Questionnaire, the State-Trait Anxiety Inventory, the Beck Depression Inventory, and the Pennebaker Inventory of Limbic Languidness. Group differences were analyzed by analysis of variance and Bonferroni post hoc comparisons.* **Results:** *Temporomandibular disorder patients with a history of physical abuse reported significantly more pain, anxiety, and depressive symptoms than did patients with a history of sexual abuse or no history of abuse. Furthermore, the results suggest that TMD patients with a sexual abuse history are not significantly different from patients with no abuse history across the domains studied.* **Conclusion:** *Based on the differences found, it can be argued that assessment of physical abuse histories by appropriately trained clinicians should be a routine part of any multimodal assessment of female chronic TMD patients.*

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Consistent and disturbing findings over the last 2 decades suggest that having an abuse history may be an important psychological factor in the chronic pain experience of women with a temporomandibular disorder (TMD) or other chronic pain conditions. There is a higher prevalence of physical and sexual abuse in chronic pain populations than in the general population. The prevalence of abuse in women in the general population has been estimated to be approximately 17%.¹ The prevalence of abuse in samples of pain patients appears to be much higher, with estimates ranging from 39%² to 69%.³

From a prevalence standpoint, there has been particular interest in the rates of sexual victimization among chronic pelvic pain patients, who often present with unexplained pain. Walker and colleagues⁴ evaluated 100 female chronic pelvic pain patients and non-pain patients scheduled for laparoscopy and found that, while there were no significant differences in objective laparoscopic findings, women with chronic pelvic pain reported higher current and lifetime rates of childhood and adult sexual victimization. There is also evidence to suggest that not all pain conditions

are similarly linked to abuse. Walker et al⁵ compared 36 patients with fibromyalgia and 33 patients with rheumatoid arthritis with regard to sexual, physical, and emotional abuse. Patients with fibromyalgia had significantly higher lifetime prevalence rates of all forms of victimization. Experiences of physical assault in adulthood showed a strong relationship with unexplained pain in this condition. Boisset-Pioro et al⁶ also found higher rates of lifetime sexual, physical, and combined abuse in 83 female fibromyalgia patients than in 161 rheumatic disease patients.

Investigations of physical and sexual abuse correlates in chronic facial pain and other chronic pain populations have found links to depression, anxiety, somatic symptoms, increased health care utilization, and, most importantly, to severity of chronic pain.^{1-4,7-10} The clinical significance of abuse experiences and their psychological sequelae among chronic pain patients is beginning to emerge in the chronic pelvic pain literature. Walker and Stanchev¹⁰ have suggested that there are important differences with regard to psychological morbidity and compliance with treatment between chronic pelvic pain patients with and without abuse. These researchers suggested that antidepressant medications may be less efficacious in women with a prior history of victimization as a result of the severity of their psychological and social needs and related poor adherence to treatment.

A major assumption of much of the research has been that physical and sexual abuse are similar in their impact on psychological morbidity and pain. Under this assumption, experimenters have routinely combined patients with physical abuse histories and patients with sexual abuse histories into 1 category labeled "abused," or have labeled patients as either sexually or physically abused when they may have experienced both. This has been the case for studies of a variety of chronic pain conditions, including back pain, headache, and carpal tunnel syndrome²; chronic pelvic pain¹¹; and orofacial pain.³

The authors are aware of only 3 studies in the abuse/chronic pain literature that have attempted to study physical abuse and sexual abuse as separate variables. The first of these, a prevalence study, gathered information regarding histories of physical and sexual abuse in childhood and adulthood in women with chronic pelvic pain, women with chronic pain in other locations, and female controls.¹² Physical abuse was defined as repeated instances of physical discipline or punishment carried out by a more powerful individual that

resulted in marks, bruises, welts, or other signs of injury. Sexual abuse was defined as any type of sexual contact, other than voluntary sexual activity with a same-aged boyfriend or girlfriend, carried out by a more powerful individual. Abuse occurring before age 18 was considered childhood abuse. Abuse occurring at age 18 or older was considered adulthood abuse. The findings of this study indicated that there was significantly more childhood physical abuse reported among chronic pelvic pain and other pain patients than among controls, but there were no differences in childhood sexual abuse among the 3 groups. The researchers also noted that, among the chronic pelvic pain patients, the prevalence of adult physical abuse in the subgroup without discernable somatic pathology was significantly greater than that reported by chronic pelvic pain patients with somatic pathology.

Another prevalence study compared the prevalence of childhood and adulthood physical and sexual abuse in women with chronic pelvic pain to that in women with chronic headaches and women who were pain-free.¹³ Physical abuse was defined as any nonaccidental act (other than sexual abuse), perpetrated upon the subject by an individual who held power or a position of advantage over the victim, that resulted in tissue damage. Sexual abuse was defined as sexual contact that occurred to the subject through force, deceit, threat, or exploitation. Sexual abuse was further differentiated into "major" sexual abuse (involving penetration or other direct contact with the unclothed genitals) or "any" (all kinds of contact). Childhood abuse was considered that which occurred before the subject's 15th birthday; adulthood abuse was abuse that occurred on or after the subject's 15th birthday. That study found a higher prevalence rate of major sexual abuse in the chronic pelvic pain patients, and more general association between lifetime physical abuse and chronic pain without respect to pain site, than between physical abuse patients and pain-free controls.

In a third study,¹⁴ a companion project to the prevalence study described above,¹³ researchers compared childhood physical abuse, adulthood physical abuse, childhood sexual abuse, and adulthood sexual abuse as predictors of psychological morbidity (ie, anxiety, depression, and somatization).¹⁴ The sample consisted of the patients from their prevalence study.¹³ The study found that childhood sexual abuse was not a significant predictor of psychological morbidity; however, childhood physical abuse predicted depression, anxiety, and somatization.

To summarize, the only studies to date that have endeavored to differentiate between sexual abuse and physical abuse have found an association between physical abuse and chronic pelvic pain, headache, and heterogeneous pain site populations. An association between sexual abuse (separate from physical abuse) and chronic pain has not emerged from the limited extant literature cited.

However, these studies suffer from methodologic shortcomings with regard to classification of groups based on abuse history. For example, in the prevalence study of physically abused chronic pelvic pain patients,¹⁴ 84% also reported a history of sexual abuse. This overlapping can pose significant threats to statistical power. As noted in a published response to this study,¹⁵ when patients with only physical and only sexual abuse histories were identified, the small samples that resulted yielded power of less than 0.10. Less substantial, yet notable, overlapping of abuse histories was also evident in the other populations examined in these prevalence studies.^{12,13}

This is a new area of research, and to date, no models have been put forth to explain a differential association between physical versus sexual abuse and chronic pain. However, 2 notions have been put forth regarding the link between abuse and chronic pain. A cognitive model was offered, suggesting that a stimulus associated with aversiveness and helplessness (such as pain in adulthood) may reactivate past representational schemas related to similarly aversive previous experiences, such as abuse, that invoke feelings of helplessness and loss of control.¹² It is argued that these expectations of helplessness may promote passive "illness" behavior and depressed mood, the self-report of which has been linked to the chronic pain experience.

Also, a preliminary causal model of the relationship between sexual/physical abuse and the chronic pain experience was posed, based on the finding that chronic pain patients with sexual and/or physical abuse histories evidenced lower pain thresholds and lower response bias (ie, hypervigilance).¹⁶ This hypervigilance may lead to altered sensory perceptions, such as painful physical symptoms. It was further argued that the chronic nature of painful symptoms reported by abused patients may also serve as internal stressors and affect patients' beliefs about their pain and coping strategies.

It was a goal of the present study to improve on the abuse history classification methodologies of prior studies by eliminating abuse history overlapping in our comparison groups. In addition, this

study examined the association between physical versus sexual abuse in chronic TMD patients, which has not yet been done. The study examined whether sexual abuse and physical abuse are unique stressors in their relationship to the pain report, affective distress, and somatic symptoms of female TMD patients. We also tested to see whether prior findings, which suggested that physical abuse is a more potent predictor of depression, anxiety, and somatization in chronic pain patients than sexual abuse,¹⁴ are supported by a more rigorous classification of abuse history. We further examined the nature of the abuse/chronic facial pain relationship. To do this we tested the following hypotheses: (1) TMD patients with physical abuse histories will report pain of greater severity and more anxiety, depression, and somatic symptoms than TMD patients with no abuse history; (2) TMD patients with a sexual abuse history will have a higher pain report and will report more anxiety, depression, and somatic symptoms than TMD patients with no history of abuse; and (3) TMD patients with physical abuse histories will report more pain, anxiety, depression, and somatic symptoms than TMD patients with a sexual abuse history.

Materials and Methods

Participants

Subjects were 114 female TMD patients (aged 18 to 86, mean age 46 years), with pain of at least 2 months duration, selected from consecutive referrals for multidisciplinary evaluation of chronic facial pain. Evaluations were carried out at the Parker E. Mahan Facial Pain Clinic at the University of Florida Health Sciences Center and routinely consisted of a dental examination, physical therapy evaluation, and psychological assessment performed by staff of the Department of Clinical Psychology. The mean duration of pain was 3 years, 8 months. The mean amount of education of the subjects was 13.5 years. Fifty-two percent of the subjects reported that they were not employed, 10.5% reported part-time employment, and 36.8% of the sample were fully employed. The majority of the subjects (59.6%) were married at the time of their evaluation, 19.3% were single, 14% were divorced, and 6.1% were widowed. The ethnic makeup of the sample was 91.2% Caucasian, 0.9% Hispanic, and 6.1% African American. Nearly 2% of the sample reported their ethnicity as "other."

Measures

A structured, behaviorally specific clinical interview was used to assess abuse histories. The use of face-to-face interviews has been associated with higher prevalence rates than self-report questionnaires.¹⁷ Sexual abuse was defined as forced genital contact or exposure to sexual behavior, or attempted or completed sexual intercourse against one's will. Physical abuse was defined as physical assault (leading to bruises, marks, welts, or other injury) carried out by a family member or an individual with whom one has an ongoing relationship.

Pain was assessed using the McGill Pain Questionnaire (MPQ).¹⁸ The MPQ is a self-report questionnaire that provides an overall pain score (MPQ-T), as well as scores on hypothesized sensory (MPQ-S), affective (MPQ-A), and evaluative (MPQ-E) dimensions. It is widely used and has been found reliable and valid in the assessment of pain.¹⁹ Data from the MPQ were unavailable for 6 patients. Therefore, these patients were deleted from all analyses of MPQ data.

The State-Trait Anxiety Inventory (STAI)²⁰ was used to assess anxiety. It is a 40-item scale used to assess both state anxiety symptoms and more general constitutional anxiety symptoms. It is widely used and well validated. Due to incomplete data, 12 patients were deleted from all analyses of state anxiety scores, and 11 patients were deleted from all analyses of trait anxiety scores.

Depression was measured with the Beck Depression Inventory (BDI).²¹ The BDI is a 21-item measure that assesses behaviors, thoughts, and affect associated with depression. Its validity and reliability as a measure of depression severity has been well demonstrated.²² The BDI data for 13 patients was incomplete. Five patients who were missing data on more than 2 items were deleted from all analyses of BDI data. Three patients were missing data on just 2 items, and 5 patients were missing data on just 1 item. Incomplete data for these 8 patients was replaced by prorated item averages based on the number of items completed.

Somatic symptoms were assessed with the Pennebaker Inventory of Limbic Languidness (PILL).²³ The PILL is a 54-item self-report symptom frequency checklist that assesses nonspecific common physical complaints on a 5-point Likert scale. Internal consistency of the PILL is high (Cronbach alpha = 0.91). Test-retest reliability over time is 0.83. Construct validity studies indicate that high PILL scorers report and are aware of more symptoms than low PILL scorers. Scores from the PILL are positively correlated with self-

reported physician visits and number of days of health problem-related restrictions in activity.²³ Data from the PILL was not available for 9 patients; therefore, those patients were deleted from all analyses of PILL scores. Nine patients had incomplete data; 8 were missing data on 1 item, and 1 patient was missing data on 2 items. This missing data was replaced with item means.

Procedure

Data were collected during the course of a multimodal evaluation at the Facial Pain Clinic. Abuse histories were assessed by staff of the Department of Clinical Psychology during the course of each patient's psychological evaluation. The self-report measures of pain, depressive symptoms, anxiety, and somatic symptoms were administered after the psychological evaluation. Since the intent of the study was to isolate sexual abuse from physical abuse and study their differential impact, patients who reported both sexual and physical abuse histories were excluded from the study.

Statistical Analyses

The sample was divided into 3 groups based on abuse history: sexual abuse history ($n = 24$), physical abuse history ($n = 34$), and no abuse history ($n = 56$). It should be noted that 5 patients with physical abuse histories reported that the abuse involved blows to the face or neck; however, there was no indication that their facial pain condition resulted from this abuse. Group differences in pain report (MPQ scores), depressive symptoms, anxiety, somatic symptoms, and demographic variables were evaluated by analysis of variance (ANOVA). When significant effects were identified, Bonferroni post hoc comparisons were conducted.

Results

The 3 groups were not significantly different with regard to age or duration of pain ($F [2, 110] = 0.370$ and $F [2, 94] = 2.12$, respectively). Effect sizes were calculated with Cohen's d .²⁴ Effect sizes of 0.2, 0.5, and 0.8 are interpreted as small, moderate, and large, respectively, when this effect size index is applied. Group differences in age yielded effect sizes ranging from 0.01 to 0.2. Effect sizes for pain duration ranged from 0.2 to 0.5. Patients with sexual abuse histories had completed significantly more years of education than patients with a physical abuse history, but they

Table 1 Mean MPQ Scores as a Function of Abuse History

Measure	SA (SD)	PA (SD)	NA (SD)	F	df	P
MPQ-T	24.1 (13.2)	34.1 (13.6)	26.3 (12.4)	5.1	(2, 105)	< 0.05
MPQ-A	2.8 (2.7)	4.2 (3.5)	2.9 (3.2)	2.0	(2, 106)	0.135
MPQ-S	13.9 (8.4)	19.1 (9.1)	15.1 (6.9)	3.7	(2, 106)	< 0.05

SA = sexual abuse history; PA = physical abuse history; NA = no abuse history; MPQ-T = MPQ total score; MPQ-A = MPQ affective dimension; MPQ-S = MPQ sensory dimension. MPQ-E (evaluative dimension) consists of 1 item and was therefore not considered reliable enough for analysis.

Table 2 Mean STAI, BDI, and PILL Scores as a Function of Abuse History

Measure	SA (SD)	PA (SD)	NA (SD)	F	df	P
STAI-S	38.7 (13.7)	46.3 (11.4)	37.9 (11.6)	4.6	(2, 99)	< 0.05
STAI-T	44.0 (11.2)	50.6 (11.8)	43.5 (12.0)	3.6	(2, 100)	< 0.05
BDI	10.9 (10.2)	18.1 (10.6)	9.7 (7.5)	8.8	(2, 106)	< 0.05
PILL	122.2 (35.7)	132.6 (33.1)	115.0 (27.6)	2.5	(2, 90)	0.085

SA = sexual abuse history; PA = physical abuse history; NA = no abuse history; STAI-S = STAI state anxiety score; STAI-T = STAI trait anxiety score; BDI = Beck Depression Inventory; PILL = Pennebaker Inventory of Limbic Languidness.

did not have significantly more education than patients with no reported abuse history. Group differences in education yielded effect sizes ranging from 0.2 to 0.8.

Table 1 reports descriptive statistics for MPQ scores as a function of abuse history and also reports results of tests of significance. Table 2 reports STAI, BDI, and PILL scores and statistical results. Table 3 reports effect sizes for group differences on each of the psychological measures.

Note from the tables that TMD patients with physical abuse histories (PA) reported significantly more pain, as measured by MPQ total scores, than did patients with sexual abuse histories (SA) or no history of abuse (NA). Effect sizes were in the large (0.75) to moderate (0.61) range, respectively. The SA patients and NA patients did not differ significantly from each other on total pain report. Differences among the SA and PA groups and the PA and NA groups in sensory aspects of pain report, as measured by MPQ-S, approached significance and yielded moderate effect sizes (0.58 and 0.52, respectively). Group differences in the affective dimension of pain, as measured by MPQ-A scores, were not significant.

The PA group reported significantly more state anxiety than the NA group, with an effect size in the moderate to large range (0.73). While the PA group did not report significantly higher state anxiety than the SA group, as was hypothesized, mod-

erate effect sizes were observed (0.61). The NA and SA groups were not significantly different from each other.

Group differences in trait anxiety were similar to those found for state anxiety, with the PA group scoring significantly higher in trait anxiety than the NA group, again with a moderate effect size observed (0.59). As with state anxiety, PA and SA group differences in trait anxiety were not significant, but a moderate effect size was observed (0.57). Similar to reported state anxiety, differences in trait anxiety between the NA and SA groups were not significant.

The most striking group differences were found in depressive symptomatology. The BDI scores for the PA group were significantly higher than both the NA and SA groups, with moderate to large effect sizes observed (0.96 when PA and NA scores were compared and 0.69 when PA and SA scores were compared). Again, the SA and NA groups were not significantly different from one another.

Group differences in symptom reporting according to the PILL were not significant, although the results were in the direction hypothesized: the PA group reported the highest number of somatic symptoms, followed by the SA group, and the NA group reported the fewest somatic symptoms. While not statistically significant, differences in symptom reporting between the PA and NA groups yielded a moderate effect size (0.60).

Discussion

By using an improved methodology for classification of female TMD patients based on abuse history, we found that female TMD patients with a history of only physical abuse reported significantly more pain, anxiety, and depressive symptoms than patients with a history of only sexual abuse or no history of abuse. Effect sizes calculated for the observed differences were consistently in the moderate to large range. Furthermore, female TMD patients with a history of sexual abuse were found to be indistinguishable from patients with no abuse history in terms of pain report, anxiety, and depression. There were no group differences in symptom reporting.

While the results of this study are not directly comparable to studies that focus on prevalence of physical and sexual abuse within and across chronic pain and pain-free populations,^{12,13} our findings do provide empirical support for studying sexual and physical abuse as separate variables. The reporting of physical and sexual abuse in separate classification schemes has been performed in only 3 previous studies. Only a single study has tested for differences across sexually abused and physically abused pain patients on measures of depression, anxiety, and somatization,¹⁴ and our results are consistent with their findings. Within the facial pain literature, no studies have reported on sexual and physical abuse as separate variables, so our findings represent the first attempt to refine our understanding of the link between abuse and chronic facial pain.

It appears that when patients report a history of physical abuse or a history of sexual abuse, but not both, these experiences may be unique stressors and should not be used interchangeably or in combination in research on pain and abuse. Conceptual and methodologic explanations have been put forth to address why sexual and physical abuse may impact patients' lives in different ways.¹⁴ One explanation for the finding that childhood sexual abuse does not predict psychological morbidity suggests that, because sexual exploitation of children can often be carried out through deception or coercion, violence and resulting tissue damage are often not a part of the experience. It was further suggested that it is only as victims mature that they may come to realize that they were abused, but the abuse may not be encoded as a traumatic event. The authors¹⁴ also discussed differences between childhood and adult sexual abuse with regard to their findings. Specifically, they speculated that adult sexual abuse is more

Table 3 Effect Sizes for Pain and Affect by Abuse History

Measure	SA vs PA	PA vs NA	SA vs NA
MPQ-T	0.75	0.61	0.18
MPQ-A	0.44	0.39	0.03
MPQ-S	0.58	0.52	0.16
STAI-S	0.61	0.73	0.06
STAI-T	0.57	0.59	0.04
BDI	0.69	0.96	0.15
PILL	0.30	0.60	0.24

SA = sexual abuse history; PA = physical abuse history; NA = no abuse history; MPQ-T = MPQ total score; MPQ-A = MPQ affective dimension; MPQ-S = MPQ sensory dimension; STAI-S = STAI state anxiety score; STAI-T = STAI trait anxiety score; BDI = Beck Depression Inventory; PILL = Pennebaker Inventory of Limbic Languidness; MPQ-E (evaluative dimension) consists of 1 item and was therefore not considered reliable enough for analysis.

often achieved through physical violence, and it may in fact be the physically abusive aspects of adult sexual abuse that are predictive of psychological morbidity, rather than the sexual aspects per se.

The abuse history assessment method employed in the present study is consistent with this conceptualization. First, in our assessment of physical abuse, emphasis was placed on painful physical injuries, including bruises, marks, and welts. In contrast, assessment of sexual abuse emphasized violation and the coercive and manipulative aspects of abuse; the threat of pain and physical violence could be construed as secondary to the abuse experience. One may then argue that our definitions of sexual and physical abuse captured the range of physical abuse experiences in which pain was a salient feature for the patient, and the range of sexual abuse experiences in which pain was not a salient feature. In effect, we removed the physically abusive aspect from the sexual abuse experience. Second, following from our methods, our findings may reflect a fundamental difference between the groups, ie, the salience of pain in their abuse experience. It may be that physically abused patients' reports of more pain, anxiety, and depression are related to the fact that they encoded their abuse experience as painful, while sexually abused patients did not.

Of course it cannot be argued that sexual abuse is not often a traumatic and painful event, but it must be acknowledged that patients' abuse histories vary. This variation must be taken into account if we are to further understand the abuse-chronic pain link. Our findings suggest that the salience of physical pain in one's abuse history may be one dimension along which abuse histories

vary. In essence, when sexual abuse is not encoded as a painful event, it may not be associated with psychological morbidity or increased pain report. Grouping patients with such a sexual abuse profile with physically abused patients, as has likely been done in the past, may have resulted in spurious associations between certain sexual abuse profiles and the chronic pain experience.

While preliminary, the results of this study are clinically important. They suggest that female TMD patients who have experienced sexual abuse of the nature assessed in this study are more similar to patients without abuse histories in that both of these groups report less pain, anxiety, and depression than patients with a history of physical abuse. Physical abuse, then, appears to be an important factor in the experience of chronic pain and the related dimensions of anxiety and depression in female chronic TMD patients. These patients appear to have affective and pain profiles that are potential targets for individualized treatment planning and outcome research.

While the strengths of this study are the improved classification of sexual and physical abuse histories, the standardization of our assessment of abuse, and the use of psychometrically sound self-report measures of psychological morbidity and symptom reporting, there are limitations. The first of these is the retrospective nature of the reports of physical/sexual abuse histories. A second limitation is our reliance on self-report measures of abuse experiences, which are subject to spurious memory for past events. Prospective studies with corroboration of abuse histories would be ideal but may be unrealistic because abuse still remains a taboo topic, despite its prevalence in society. Thus, while disclosure about past abuse experiences may occur within the bounds of confidentiality of the clinical setting, corroboration is unlikely and may be unreliable. Despite these limitations, future research focusing on the severity, frequency, and duration of abuse and age at the time of abuse in chronic facial pain and other pain patients with physical or sexual abuse histories may provide important contributions to this largely unexplored arena of the chronic pain experience.

This study makes an important contribution to continuing research on the association between abuse and chronic pain in general, and abuse and TMD in particular. Differences between the female chronic facial pain patients with physical versus sexual abuse histories and between the chronic facial pain patients with physical versus no abuse history, with regard to pain report, anxiety, and

depression, yielded medium to large effect sizes. This suggests that knowledge of a patient's abuse history, specifically a history of physical abuse, provides potentially important information about a patient's chronic pain experience. Based on the differences found, it can be argued that assessment of physical abuse histories by appropriately trained clinicians should be a routine part of any multimodal assessment of female chronic TMD patients.

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