

Chapter #15

PERSONALITY, GENDER AND ETHNIC DIFFERENCES IN ASSESSMENT OF CHRONIC PAIN SYNDROME (CPS)

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ABSTRACT

Chronic pain syndrome (CPS), a multifaceted biopsychosocial phenomenon, is a great medical, quality of life and socioeconomic concern, leading up to many permanent total disabilities, drug overdose and deaths in USA. Multiple variables may be associated with this problem. Psychologically, certain patterns on MMPI-2 have been associated with CPS. This archival study examined a sample (N=275) of industrially injured patients with CPS for the effects of gender, ethnicity, marital status and personality disorders, psychometrically. First, P-3 & MBMD for the initial screening and if necessary, MMPI-2 and MCMI-III were administered. The sample was cleaned up by excluding the invalid protocols. Descriptive statistics and one-way analysis of variance were used to examine personality scales of the MCMI-III and clinical scales of the MMPI-2. Only a few scales measured significant effects for marital status, but significant gender and ethnicity effects were shown on several scales of MMPI-2, MCMI-III and MBMD at $^{**}p<.01$ and $^{*}p<.05$. MCMI-III severe personality disorders highly correlated with MMPI-2 pathologically disabling patterns. Certain personality types may be more susceptible to CPS. Limitations, lack of randomized sampling and control group, with implications to assessment, treatment and med/legal evaluations, will be discussed along with suggestions for future research.

Keywords: pain, personality, gender, ethnicity, MBMD, MCMI-III, MMPI-2.

1. INTRODUCTION

Response to and coping with chronic pain has been a serious subject of studies biopsychosocially for decades. Medical model and related policy making agencies in the United States are facing critically high rates of permanent total disabilities (PTD) and deaths due to chronic pain and overdose on opioids, many of which might have started with Motrin, Vicodin or Norco for pain management that progressively lead up to tolerance and dependency on Oxycontin and heroin for pain management, Xanax for anxiety and insomnia management. According Center for Disease Control and Prevention (CDC: December 30, 2016) 61% of 47055 drug overdose deaths involved an opioid in 2014. Unintentional opioid overdose deaths, driven by commonly prescribed opioids, heroin and synthetic opioids like Fentanyl have continued to increase so rapidly (more than 59000 deaths in 2016) that President Trump on October 26, 2017 directed the Department of Health and Human Services to declare the opioid crisis a public health emergency. In no professional or media discussions around this crisis, alternative and adjunctive assessment and treatment approaches, including, personality assessment based bio-psycho-social treatment approaches to chronic pain assessment, treatment and functional restoration have been brought up adequately yet.

Back in 2001 the writer initiated an interdisciplinary semi day treatment program, Team Power- for orthopedically injured patients suffering chronic pain with secondary symptoms of stress, anxiety, depression and insomnia. Every referral was screened by the team's main staff that included clinical psychologist, physical therapist and physiatrist. Knowing that chronic pain is a syndrome that may have multiple bio-psycho-social causal factors, this archival study has examined a possibility of certain personalities being more susceptible to developing chronic pain syndrome (CPS) and drug dependence.

Research in different areas of pain assessment, in recent years, has led us to new understandings of chronic pain and fibromyalgia syndrome (CPS). Neurochemistry and endocrinology of acute and chronic pain appear to be totally different, not only through out the peripheral and autonomic nervous systems but also in the central nervous system, perception of the injury and pain as a life changing traumatic and catastrophic, changes the neurochemistry of the central nervous system (Mailis-Gagnon, Granolas, Downer, & Kwan 2003; Nijis & Van Houdenhove, 2009). Not every acute injury and pain, regardless of the severity of the injury, becomes a CPS. This has raised interesting biopsychosocial questions.

There seems to be significant differences between localized acute pain and generalized chronic pain/ fibromyalgia syndrome, neuro- physiologically (Nijis & Van Hoodenhove, 2009) and psychologically/psychometrically (Gatchel, 1997; Turk & Gatchel, 2002; Gatchel, Kishino, & Robinson, 2006). In the process of pain becoming chronic and generalized, recent research has indicated central pain pathways getting over-sensitized. Functional MRI studies on patients with CPS also, have shown altered somatosensory – evoked responses in specific forebrain areas (Mailis-Gagnon et al, 2003).

Gatchel and his colleagues have found a psycho- pathologically disabling pattern on MMPI-2 to be associated with CPS. In his view, patients with borderline personality disorders are more likely to become disabled due to chronic pain (Gatchel, 1997 & 2006). Therefore many questions are raised about contributions of the personality traits and disorders to the development of CPS, drug dependence and temporary or permanent disabilities as results of CPS. Gatchel and others have already identified three distinct patterns on the MMPI-2 profiles of chronic pain patients: a. The Classic “conversion V” (MMPI-2 Scales 1&3>2, all three with T-Scores 65 or greater). b. The “Neurotic Triad” pattern in which the MMPI-2's scale 2 is significantly more elevated than the Scale 1 and 3. And c. The “pathologically disabling” pattern is one of the focuses of this study. This pattern on the MMPI-2 of the CPS patients has four or more clinical scales significantly elevated.

Common psychometric patterns of clinical psychopathology associated with CPS and disability were examined and presented at Society for Personality Assessment- 2008 convention in New Orleans, Louisiana. (Argun & Singleton, 2008), with the use of the MMPI-2(Hathaway et al., 1989), MCMI-III (Millon, Davis, & Millon, 1997), MBMD (Millon, Antoni, Millon, Meagher, & Grossman, 2001) and P-3 (Tollison & Langley 1995) as the objective measurements. A case study of one of these CPS patients with assessment, treatment and treatment outcome evaluation data was presented in 2013 (InPACT. Madrid, Spain. 2013). Current study has further focused on the personality, gender, ethnicity and marital status effects on the same archival sample. These effects are measured with the use of the same objective psychometric measures, P-3, MBMD, MCMI-III and MMPI-2 for a more individualized and evidence based treatment planning, diagnostic specificity, in differential diagnostic assessment of CPS patients.

This study examines the complimentary use of the MCMI-III with MMPI-2 for more diagnostic specificity and increased incremental validity in differential diagnostic assessment of CPS. Present study has also, looked into the gender, marital status and culture/ethnicity as differentiating variables. Several studies have looked into the effects of gender, age, ethnicity/race/genetics and culture on pain perception, coping with and adjustment to chronic pain and disability issues (Unruh, 1996), but mostly based on interviews and or self rated pain perception measurements or biological, genetic models. Most psychological research in this area have focused on the assessment (Gatchel, 2004), self efficacy, depression and disability (Amstein, Wells-Federman, & Caudill, 2001) and cognitive behavioral treatment and management of chronic pain (Jensen, Romano, Turner, Good, & Wald 1999).

2. DESIGN AND OBJECTIVES

The main objectives of this study were the complimentary relationship between the MCMI-III and MMPI-2 in identifying the three patterns of “conversion V”, the ‘neurotic Triad’ and the “pathologically disabling” patterns in this population. It has specifically looked into the ability of MCMI-III severe personality disorder scales in defining the significance of the MMPI-2 Patterns in this population. It was hypothesized that because of the promising construct validity of the MCMI-III, this test may be able to break down the MMPI-2 patterns into more specific personality traits or disorders. The study’s special interest was in the ability of the MCMI-III to detail further the ‘pathologically disabling’ patterns on the MMPI-2. The secondary objectives of this study were to also, look into the effects of independent variables (IVs) such as gender, ethnicity, and marital status, as measured by MMPI-2, MCMI-III, MBMD and P-3.

3. METHOD

3.1. Subjects

All patients (N=275) included in this study were non-cancer “chronic pain patients”, who had medical evidence of orthopedic and or psychological industrial injuries who had gone through exhaustive medical examinations and treatments, including but not limited to pain, anti-inflammatory, neuromuscular relaxation, sleep and anxiety medications, physical therapy, epidural injections and acupuncture. Many of these patients had, also, undergone through one or more “failed” orthopedic surgeries and fusions. There were 108 males and 167 females , 57% Caucasian American, 23% Hispanic American , 9% African American, 3% Asian American, and 7% others. Patients were first administered the P-3 and MBMD as parts of the initial screening and admission to a Biopsychosocial pain management program, Team Power. MMPI-2 and MCMI-III were administered only when multiple elevations were obtained on MBMD and P-3 scales (See Table1 below).

3.2. Instruments

Minnesota Multiphasic Personality Inventory (MMPI-2) (Hathaway et al., 1989), Millon Clinical Multiaxial Inventory (MCMI-III) (1997) The Millon Behavioral Medical Diagnostic (MBMD) (Millon et al., 2001, and Pain Patient Profile (P-3) (Tollison & Langley 1995) were used as the objective measures in this study. MMPI-2 is a well known psychometric test with 567 True-False items for personality assessment. It has the best reputation for clinical and forensic differential diagnosis and assessment of malingering.

MMPI-2 has been used clinically and forensically for multiple purposes including pain assessment for decades (Hathaway et al., 1989, Gatchel, 1997 & 2006).

Millon Clinical Multiaxial Inventory (MCMI-III) (1997) consists of 175 multiple choices, true-false items. It was used for its complimentary incremental validity purpose with MMPI-2 in this study. MCMI-III is a clinical and personality test, designed to differentiate Axis II traits and severe personality disorders from Axis I clinical syndromes. It is a base rate based instrument, constructed in early 1980s by Theodore Millon (Millon et al. 1997). In this study it was included in the battery for the purpose of ruling out pre-morbid personality traits/ disorders and cross validate on the clinical syndromes with MMPI-2.

The Millon Behavioral Medical Diagnostic (MBMD) (Millon et al., 2001) is a base rate based inventory of 165 True –False items, designed to provide important clinical psychological and psychophysiological information, often used in pre-surgical psychological clearance evaluations as well. MBMD was standardized on patients with physical/medical illnesses and chronic pain. The test is structured for adult patients, ages 18-85 with at least 8th grade level education, who are undergoing medical care or surgical evaluations with possible psycho-social problems impeding the medical procedures and recovery.

Pain Patient Profile (P-3) (Tollison et al., 1995) is a 44 item multiple-choice self-report instrument constructed to assess patients who may be experiencing emotional distress, secondary to pain. The instrument has three clinical scales of Somatization (Som), Anxiety (Anx) and Depression (Dep) with a Validity Index to assess the probability of random responding, exaggeration or comprehension difficulties. P-3 is standardized on both pain patients and samples from the community. P-3 can be administered in 15-20 minutes to 17 – 76 years old patients who have at least 8th-grade level reading and comprehension abilities.

3.3. Procedures

These patients were all involved in the initial screening including, clinical interview, mental status examination, medical records review and administration of a screening package that also included P-3 and MBMD. When the two profiles of the MBMD and P-3 were positive significantly for wide spread symptoms of psychopathology, the patient then was further assessed with administration of the MCMI-III and MMPI-2, to rule out premorbid and/or co morbid mental and/or personality disorders and malingering.

For this study, the original archive of 275 protocols was cleaned up. The invalid protocols were excluded from the sample. A total of 169 P-3 protocols (67 male and 102 females), 221 MBMD (84 males and 137 females), 185 MMPI-2 (76 males and 109 females) and 190 MCMI-III protocols (75 males & 115 females) were qualified for this study. The Analysis included both descriptive statistics and One-Way ANOVA. Three Variables were created for MCMI-III severe personality disorders scales of Schizotypal “S”, Borderline “C”, & paranoid “P” as: a. “Low” group with base rate score(BR) of 0-74; b. “Moderate” group with BR of 75-84; and c. “Elevated” group with BR of 85+.

The Analysis, also, included: a. Correlating the overall S, C, and P grouped scores with the MMPI-2 basic clinical scales, 1-0; b. ANOVAs that were run for the S, C, and P groups across all of the basic clinical scales of the MMPI-2; and c. Also,, graphically evaluated the MMPI-2 basic clinical scales as well as the Restructured Clinical Scales (RC) and PSY-5 Scales across the MCMI-III groups. The PSY-5 Scales were eventually excluded because of insignificant low scores across the board.

4. FINDINGS

4.1. Clinical and personality patterns

Total of 185 subjects (n=185) showed significant elevations (T-Scores > 65) on MMPI-2 scales of 3, 2, 1, 8, 7& RC1. There were no significant gender differences in the order of the severity on the MMPI-2 scales. Both men and women's significant scores on the MMPI-2, from the most severe to the least, were on the scales 3, 1, 2 (Conversion Valley), RC1 (Som = Somatic Complaints), 8, &7(Cognitive and emotional problems).

Correlation analysis between the MMPI-2 basic clinical and MCMI-III severe personality disorder scales of Schizotypal (S), Borderline (C), and Paranoid (P) indicated the strongest correlations between the Scales 2 (D), 6(Pa), 8(Sc) & 0(Si) on the MMPI-2 and three scales of S, C, and P on the MCMI-III at ***p<.001. There was also a strong correlation between the scale 4 (Pd) of the MMPI-2 and the scale C of the MCMI-III at ***p<.001. The scales S and C of the MCMI-III also correlated strongly with the scale 7(Pt) of the MMPI-2 at ***p<.0001. Scale 9 (Ma) on MMPI-2, also, correlated strongly with the C scale of the MCMI-III at ***p<.0001. It should be noted that correlations .30 or below were not included in this analysis despite significant levels at **p<.01 and *p<.05. In putting the strongest correlations above in order, the Borderline personality disorder scale (C) correlated with seven of the MMPI-2 scales respectively, from high to low, with scales 8, 7,6,2,4, 9, &0. The schizotypal personality disorder scale (S) correlated highly with 5 of the MMPI-2 scales of 0, 9, 7, 6, &2. The Paranoid personality disorder scale (P) only correlated with 4 of the MMPI-2 scales 0, 6, 8, & 205 (Table1 below).

Table1.
Significant Correlations between MMPI-2 basic scales & MCMI-III severe personality scales.

	<i>MCMI-II:Scale S</i>	<i>Scale C</i>	<i>Scale P</i>
<i>MMPI-2 Scales:</i>			
<i>Scale2(D)</i>	<i>0.445***</i>	<i>0.465***</i>	<i>0.312***</i>
<i>Scale4 (Pd)</i>	<i>0.236**</i>	<i>0.456***</i>	<i>0.133</i>
<i>Scale6 (Pa)</i>	<i>0.446***</i>	<i>0.505***</i>	<i>0.326***</i>
<i>Scale7 (Pt)</i>	<i>0.466***</i>	<i>0.562***</i>	<i>0.270***</i>
<i>Scale8 (Sc)</i>	<i>0.514***</i>	<i>0.592***</i>	<i>0.323***</i>
<i>Scale9 (Ma)</i>	<i>0.165*</i>	<i>0.271***</i>	<i>0.193*</i>
<i>Scale0 (Si)</i>	<i>0.550***</i>	<i>0.439***</i>	<i>0.451***</i>

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The MCMI's Borderline personality disorder scale (C) had the highest correlation of .100 with the scale 8 (Sc), the psychotic triad of the MMPI-2. Both Schizotypal (S) and Paranoid (P) scales of the MCMI's highest correlations of .74 - .80 were with the scale 0 (Si) (social isolation) of the MMPI-2. RC1 (Somatic Complaints) of the MMPI-2 correlated highly and consistently with all three severity groups of Schizotypal (S), Borderline (C) and Paranoid (P). Other findings suggested the MCMI-III "Low" group associating with the MMPI-2 "Conversion V". The "Moderate" and "Elevated" groups of scores were not significantly different and correlated with both the neurotic triad and psycho-pathologically disabling patterns (Table2).

Table2.
Means, Standard Deviations, n, F ratio & eta squared for MCMI-III Scales S, C, & P (Low, Moderate and Elevated Groups) on MMPI-2 Basic Scales.

	MCMI-II: Scale S : Low: n=118	Moderate: n=2	Elevated: n= 43		
	M (SD)	M (SD)	M (SD)	F	P
r2					
<i>MMPI-2 Scales:</i>					
Scale0	53.56(11.099)	62.62 (12.147)	57.84 (11.687)	7.281	
.001	.074				
	MCMI-II: Scale C: Low: 103	Moderate: n=21	Elevated: n= 61		
<i>MMPI-2 Scales:</i>					
Scale8 (Sc)	64.37 (15.100)	78.76 (12.506)	72.46 (17.384)	10.057	
.000	.100				
Scale4 (Pd)	59.50 (13.180)	72.71 (14.360)	65.61 (14.817)	9.516	
.000	.095				
Scale0 (Si)	52.60 (11.092)	60.33 (11.935)	59.41 (11.366)	8.959	
.000	.090				
Scale6 (Pa)	57.29 (13.657)	65.67 (17.414)	66.77 (19.035)	7.492	
.000	.76				
Scale7 (Pt)	64.07 (14.274)	73.95 (18.459)	70.97 (14.809)	6.298	
.002	.065				

<i>Scale9 (Ma)</i>	50.71 (10.371)	59.05 (12.524)	52.54 (8.793)	5.923
	.003	.061		
	MCMII-II: Scale P: Low: 95		Moderate: n=41	Elevated: n=49
<i>Scale 0 (Si)</i>	52.52 (11.772)	58.95 (9.252)	59.27 (12.034)	7.877
	.001	.080		
<i>Scale9 (Ma)</i>	50.47 (9.618)	56.88 (12.129)	51.86 (9.356)	5.744
	.004	.059		
<i>Scale3 (Hy)</i>	79.38 (14.672)	72.44 (17.805)	75.67 (14.207)	3.492
	.033	.037		

4.2. Gender effects

On P-3, only the Depression Scale showed significant gender effect at $*P<.05$, the males reporting more depressive symptoms than the females (53.06 v. 31.77). A One-Way Analysis of Variance for the effects of gender on MBMD indicated multiple scales being affected. The men scored significantly higher Means on MBMD scales, measuring Guardedness (52.72 v. 39.67), Introversion (70.92 v. 52.67), Nonconformity (50.62 v. 36.80), and Forcefulness (46.34 v. 31.90) at $**P<.01$. The men also scored much higher on MBMD scales, measuring, Inhibition (66.99 v. 52.64), Dejected (63.75 v. 46.39), Oppositional (64.15 v. 52.97), Social Isolation (62.41 v. 48.63), and Utilization excess (68.62 v. 56.23), significant at $*P<.05$, all with greater Means for the males v. the females.

On the gender issues MMPI 2 suggested significant differences between the male v. female patients. The men experienced and reported more symptoms, secondary to chronic pain, on scales, measuring, Disorderly and Disorganized Thinking (81.14 v. 66.39), Demoralization (70.34v. 57.49), Dysfunctional Negative Emotions (62.83 v. 49.20), Aberrant Experiences (64.07 v. 49.72), Hypomanic Activation (52.42v. 43.21) and Psychoticism (62.88 v. 50.98) at $**P<.01$. The men also, reported greater Psychopathy (69.33 v. 58.57), Paranoia (67.90 v. 58.04), Anxiety, Stress and Obsessive Thoughts (77.51 v. 66.39), Mania (57.11 v. 49.96), Somatic Complaints (79.02 v. 69.28), Antisocial Attitude (57.77 v. 47.97), Disconstraint (49.09 v. 43.07), and Negative Emotionality (64.34 v. 53.73).

On MCMI-III, several personality and clinical scales showed greater gender effects for the men except one. MCMI-III scale measuring Compulsive behaviors showed greater Mean for the women than men (63.51 v. 49.39 at $**P<.01$. MCMI-III scales, measuring Dysthymia and Thought disorder, also, showed the men with greater Means (respectively 72.21 v. 55.83, & 58.20 v. 45.91 at $**P<.01$. Significant differences were also measured at greater level for men versus woman on MCMI-III scales, measuring, Histrionic (74.21 v. 59.08), Antisocial (46.76 v. 38.51), Sadistic (60.37 v. 43.75), Schizotypal (54.37 v. 22.41), Borderline (52.88 v. 43.35), Anxiety (69.97 v. 59.26), Alcohol (48.37 v. 40.65), Drug (43.73 v. 36.08), and Posttraumatic stress symptoms (54.99 v. 46.98).

4.3. Ethnicity effects

The MBMD showed a statistical significance only on one scale, measuring “cognitive dysfunction” for African American v. Caucasian American patients (67.94 v. 47.95). For the effects of ethnicity/race, MMPI 2 suggested significant differences on only 2 scales, measuring, Abberant Experiences and Bizarre Mentation for the Asian, greater than the Caucasian greater than Hispanic American patients with respective Means of 71.73 < 52.90 < 49.83 on the first scale (Abberant Experiences and 74.33 < 52.93 < 52.26 on the second scale (Bizarre Mentation). On MCMI-III, several scales indicated significant ethnic differences. On a scale, measuring, Compulsive behaviors, , showed greater Means for African American v. Hispanic v. Caucasian v. Asian American patients with respectively Means of 65.00 > 62.78 > 57.56 > 43.14 at **P=.01. On the scale measuring, schizotypal traits, Asian American patients had Means greater than African Americans, Hispanic Americans and Caucasian Americans with respective Means of 66.86 > 59.38 > 45.60 > 42.68 at **P=.01. On the Anxiety scale of the MCMI-III, the Means were measured significantly greater for the Asian American patients v. African American v. Hispanic American v. Caucasian American patients with respective Means of 80.14 > 77.86 > 65.05 > 58.09. On MCMI III scale, measuring, problems with drug dependency or abuse, the analysis showed greater Means for the Asian v. Hispanic v. Caucasian v. African American patients with respective Means of 63.67 > 58.43 > 42.88 > 28.00. On the Delusional Disorder scale, the Asian patients obtained greater Means than the African American, Hispanic American and Caucasian American patients.

4.4. Marital status effects

Only two of MBMD scales, Drug and Sociable scales showed the singles with greater Mean than the married patients at **P.01. The divorced patients showed greater Mean than the married or widowed ones on the Sociable scale of the MBMD. On MMPI 2 only one scale was affected by the marital status. MMPI subscale of Somatic Complaints measured greater Mean for married v. Single patients, 80.54 > 69.79 at *P=.01. Only Schizotypal and Delusional Disorder scales of MCMI III measured significant Means for marital status effects. Single patients reported more disorderly and disorganized thinking problems than widowed patients (60.32 > 15.40 at **P=.01). Single patients also, reported more delusional symptoms than the widowed patients (55.18 > 15.80 at *P=.05).

5. CONCLUSION/DISCUSSION

The Findings in this study showed that the MCMI-III was a good compliment to the MMPI-2 in the assessment of patients suffering non-cancer chronic pain. Overall findings on the MMPI-2 were strongly supportive of and consistent with the earlier findings by Gatchel and others (1997 & 2006) with non-cancer chronic pain patients. MCMI-III and MMPI-2 together provided more clear data for differential diagnosis, individualized treatment planning, prognosis and evidence based clinical and industrial recommendations. MCMI-III showed no severe personality disorders associated with the first pattern, “conversion V” on MMPI-2. The “neurotic triad” and “psychiatrically disabling patterns” on MMPI-2, however, were associated with both moderate and severe degrees of borderline, schizotypal and paranoid personality disorders. Therefore the “psychiatrically disabling pattern”, on MMPI-2, was not just associated with MCMI-III Borderline Personality Disorder scale but also with Schizotypal and paranoid Personality Disorders

scales. MCMI-III and MMPI-2 with “Conversion V” profile, combined with clinical and historical data helped in differential diagnosis of chronic pain disorder from several other ICD-10 diagnoses (F45.1-45.9). These two tests together also differentiated the Neurotic triad and psychiatrically disabling patterns on MMPI-2 better, in specifying the personality contributions to the development of chronic pain syndrome and many cases to a diagnosis of fibromyalgia (CPS) (ICD-10:F45.42 and F54).

Not many authors have yet investigated the potential of the MCMI-III with pain population, except for Manchikanti and his team (Manchikanti, Fellows, & Singh, 2002) who found no significant differences in personality patterns of pain patients. In this study, although with relatively small and non-randomized sample, the MCMI’s promising constructive validity seems to be showing itself as relevant to pain assessments, in terms of differentiating the personality disorders and traits from the clinical syndromes. It is highly likely that the chronic stressors associated with the industrial injuries, failed surgeries, opioid and non-opioid medication side effects and slow process of medical care in workers compensation system in California and psycho-social and financial effects of the injury and disability may have activated, exacerbated or aggravated the pre-existing potentials for these personality traits and disorders. It appears therefore, that the MCMI’s severe personality disorders scales of Borderline (C), Schizotypal (S) and Paranoid types showed promising differential diagnostic value, complimenting the MMPI-2.

With the MCMI-III, many patients’ diagnosis and treatment planning became much clearer without misleading into a variety of other disorders such as schizophrenia, bipolar, or schizoaffective and others v. Borderline, Schizotypal, or paranoid personality disorders or traits. It looks highly likely that people with severe personality disorders, especially borderline and schizotypal personality disorders may be more susceptible to developing CPS and secondary psychological problems, including aggravation of pre-existing physical and psychological traumas. These preliminary findings following more studies may have great implications to these patients’ differential diagnosis, individualized treatment planning, ruling out exaggeration/malingering and the choice of treatment approaches and modalities (Gatchel, 2004, Argun, 2013). These findings may be also helpful in the med/legal evaluations of industrial or personal injuries, disability ratings, ruling out pre-existing personality disorders and apportionment.

Findings on the Paranoid Personality scale of the MCMI-III and scale “6” and “0” of MMPI-2 might have been affected or aggravated by the perception that some agents with cameras from their workers compensation insurance were after them to establish evidence against their industrial claims in order to deny the necessary treatments and benefits. Such perception might have also contributed to their higher scores on scales measuring social isolation and decrease in social and recreational activities. These associations do deserve more clinical, industrial, and organizational investigations and research. It is highly probable that policies and subculture in California may be back firing and significant negative effects on their patients’ levels of mistrust and paranoia, demoralization, social and emotional isolation, contributing to a significant number of permanent total disabilities which is not in the best interest of any parties.

The gender and ethnic variables were also interesting and overall were associated with significant differences, as measured by MMPI-2, MCMI-III and MBMD. Contrary to some of gender and pain perception studies, the men in the sample showed more vulnerability and more severe secondary psychosocial, emotional symptoms and dysfunctional personality traits than the women. Based on these limited findings, an overall, better prognosis is projected to women, in dealing with physical injuries; chronic pain, functional restoration and return back to work. This observation, of course needs more

research and investigation which may have to do with both nature and nurture effects. Women, as my psychophysiology and psychobiology professor, late Dr. M. Behzad (1913-2007) use to say, are, psych-biologically stronger with lower risk taking traits and higher stress management skills. Many of them also have had life experiences such as handling nine months of pregnancy and labor that may have made them stronger than men in handling pain and stress. Perhaps, the evolutionary process, social networking abilities and historically child rearing and responsibilities to keeping the family together, have also made them more resilient and hopeful. The findings on the gender factor were quite surprising with this population. Contrary to many socio-cultural stereotypes the women had milder reactions to the injury, in severity of pain sensitivity, depression, anxiety, insomnia, social and emotional alienation, and medication dependency rates. Many men probably perceived the physical industrial injury as a major trauma and as an injury to their masculinity and self image. Overall these limited findings are also consistent with some and contrary to other studies on gender, ethnicity, chronic pain, and disability in recent years. This finding supports Anita Unruh's (1996) concerns for and objection to some health providers' psychogenic attributions about women being more vulnerable than men to coping with chronic pain.

Race and ethnicity also seemed to play significant role in the patients' pain perception and coping with physical functional limitation, disability and chronic pain but with mixed results that defined some of the earlier studies. Ethnicity variable varied on different scales and measurements. African American patients tended to show more cognitive and thinking problems and compulsive behaviors in response to chronic pain, but less sensitive to and less dependent on pain, sleep, and anxiety medications. Asian American patients reported more traumatic, schizotypal, and overanxious symptoms in response to chronic pain. The Hispanic patients mostly scored somewhere in the middle between Asian and African American patients or Asian and Caucasian American patients. Asian American and Hispanic patients showed the highest sensitivity as measured on the Drug scale of the MCMI-III than the other two ethnic groups. This raises several serious clinical and research questions about ethno-pharmacological sensitivity of these two groups to opioid based medications. Some of their pseudo-psychotic and cognitive symptoms may be in reaction to some of these medications.

Among these tests, the MCMI-III showed and measured more gender and ethnic differences in coping with chronic pain than the other three tests. MMPI-2 was the least affected by ethnic effects except on two subscales of Abberant Experiences and Bizarre Mentation with Asian American patients scoring significantly higher than Caucasian and Hispanic American patients. MBMD was overall more sensitive to the gender factor in identifying the men with higher Mean scores than the women, on scales measuring, their coping styles, compliance with treatment and utilization excess. It is therefore safe to say that the individual's personality and defense mechanisms, perhaps the director/regulator of the immune system- plays significant roles, not only in psychosocial defense mechanisms in coping with perceived pain and stress associated with the perception of the injuries, and "failed" surgeries but also, perhaps in regulating the neurochemistry of the central nervous system (CNS) and consequently the peripheral nervous system (PNS) and autonomic nervous system (ANS). It is also safe to say that identifying more specific personality traits and disorders in the pain assessments, may open up, not only a better understanding of the CPS, but also, may contribute to a more evidenced based diagnosis, treatment, and med/legal evaluations and recommendations. Assessment of personality variables and inclusion of psycho-physiological and cognitive behavioral treatments, as early in process, as possible may be very relevant for greater success of the medical interventions adjunctively but also for the reduction in PTSDs, drug dependency and deaths due to overdosing on opioids.

6. LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

The findings have many limitations. The most important findings were on the effects of personality disorders, ethnicity and gender as significant variables, possibly making the individual more susceptible to developing CPS and PTSD. Ethnicity and gender variables should be also examined more and considered in treatment planning, prognosis and med/legal evaluations and recommendations, in dealing with industrially injured patients with chronic pain.

Limited sample size clearly precluded more complex statistical analysis as well as the generalizability of the results. Future studies may look into many compounding variables, including but not limited to randomizing and stratifying the samples with comparison groups; increasing the sample size; looking into the correlations and correspondence between the MBMD, MMPI-2 and MCMI-III clinical scales as well; looking into the effects of medications, illicit drugs and alcohol use by these patients, especially the opioid drug dependency; looking into and comparing the groups with traditional medical model treatment approach v. comprehensive bio-psychosocial, interactive interdisciplinary treatment and functional restoration model; including longitudinal data such as types of injuries, surgeries, interventions, treatment outcomes, work/disability status, functional restoration and rate of return to work; roles and effects of prescription drug dependency on the rates of permanent total disabilities; and Relationship between the personality disorders and traits with prescription drug dependency, especially the opioids. Future studies should also, include additional demographic, medical, psychiatric, substance abuse history and socioeconomic variables, in order to further specify the predictive and prognostic patterns. Using larger samples with longitudinal data may also, help in exploring the predictive validity of the MMP-2, MBMD and MCMI-III in chronic pain patients.

It should be noted that this study by no means attributed all of the CPS effect on Personality traits or disorders. Future studies should look into trying to use multiple regression and other sophisticated statistical measurements/ analysis and variables to understand better the most primary factors of disabilities, due to industrial injuries and CPS. In my two decades of work with this population, invisible factors such as the patient's disillusionment about employment and workers compensation system in California, delays in authorization of treatment, surgeries and post-surgical care, may be playing significant roles in demoralization of these patients, in certain personality types more than the others. This issue is worth studying more systemically as well for the cost effectiveness of the care provided by the existing system.

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