

## Personality Characteristics and Depression Among Chronic Pain Patients

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### Abstract

The purpose of this study was to detect personality profile among organic and functional pain patients, to assess depression among all patients and to evaluate relation between depression and severity, duration of pain and limitation of movement due to pain. 48 chronic pain patients with organic etiology, 45 chronic pain patients with no physical etiology of pain and 48 non patients without pain all were subjected to: physical examination including local examination to assess degree of pain, tenderness and limitation of movement. Plain X-ray for both knees, cervical and lumbosacral regions, posteroanterior and lateral views. Three psychological tests were administered; mini MMPI, Beck depression inventory and Hamilton depression scale. Data from this study revealed that personality profile of chronic pain patients showed typical chronic pain profile and functional pain patients also showed psychologically disturbed profile. Depression was closely related to pain and there was positive relation between depression and severity and duration of pain, while there was no relation between depression and limitation of movement due to pain. The personality profile of functional pain patients differs from those of organic etiology and there is a positive relation between depression and pain

**Introduction:** Chronic pain and depression are acknowledged to be closely associated. The association is based in part on findings that showed generally a high prevalence of major depression in pain population (France et al., 1984).

As the pain becomes chronic, the patient may become depressed, angry, somatically preoccupied, and progressively sedentary (King and Kelleher, 1991). Literature suggested that personality variables also contribute strongly to the development and maintenance of chronic pain syndromes (Southwick and White, 1983). Early work proposed that chronic pain patients displayed a rather uniform personality profile characterized by elevations on MMPI scales of depression, hysteria and hypochondriasis (Pilling et al., 1967). Many studies characterize

chronic pain as a more heterogeneous disorder with respect to psychological variables identified by the MMPI (Naliboff et al., 1983). Bradley et al. (1978) used multivariate clustering procedures to isolate homogenous subgroups of MMPI personality profiles within a sample of back pain patients. In male patients three subtypes were derived. one had elevations on scales Hs, D and Hy. The second configuration was characterized by widespread scale elevations and by high levels of depression, emotional isolation and somatic preoccupation. The third was an unelevated pattern with evidence of conflict over dependency. These subgroups were replicated in other low back pain populations (Hart, 1984), as well as in samples with diverse pain problems (Armentrout et al., 1982).

**Objectives:** The purpose of this study

was to compare the personality profile in a sample of chronic pain patients with physical etiology and other pain patients with no evidence of organic etiology: To assess depression among all patients. To assess relation between depression and severity, duration of pain and limitation of movement.

**Subjects and Methods:** Three study groups:

**Group 1:** Consisted of 48 chronic pain patients (8 males and 40 females) attending outpatient clinic of Rheumatology and Rehabilitation department. (Zagazig Univ. Hospital)

The criterion for selection was pain on a daily basis for 6 months or longer (as chronic pain has frequently been defined as any pain lasting more than 6 months) (King and Goddard, 1994). All patients were physically examined to establish physical etiology for pain complaint. The mean age was 46.25 with a range of 33 - 55 years. The mean age onset of pain was  $42.93 \pm 8.70$ , the mean duration of pain was 3.19 with a range 1-10 years. The sites of pain complaint were as follows: extremities (37.5%) and neck (62.5%). The medical diagnosis of pain complaint were knee osteoarthritis (37.5%) and cervical spondylosis (62.5%).

**Group 2:** Consisted of 48 chronic pain patients (all females) attending to outpatient clinic of Rheumatology and Rehabilitation Department.

All patients were physically examined to establish absence of physical etiology of pain.

The mean age was 33 years with range of 18 - 40 years. The mean age onset of pain was  $28 \pm 5.18$  with pain duration range 1 - 4 years. The sites of pain complaint were as follows; extremities (15%), neck (45%) and back (40%).

**Group 3:** Control group consisted of 30 females and 18 males with no complaint of pain, mean age  $36.06 \pm 10.46$  with range of 18 - 50 years. They were chosen from workers in the Zagazig University Hospital and relatives of the patients.

All the studied groups were subjected to:

**1. Clinical assessment:**

- Full history taking.
- Local examination including: Evaluation of pain severity (pain score). The pain evaluation was graded according to Jaffe (1974) into four grades: Grade 0: no pain  
Grade I: slight pain, non continuous  
Grade II: Moderate pain, constant readily bearable.  
Grade III: Severe pain, continuous or distressing.

-Evaluation of tenderness:

Tenderness was graded according to Gunn (1976) as follows:

- Grade 0: no tenderness whatsoever is elicited by firm digital pressure.
- Grade I: Patient is aware of some tenderness as pressure is applied but it is not unpleasant.
- Grade II: Tenderness is moderate and unpleasant.
- Grade III: Tenderness is acute, so that the patient is surprised and react vigorously.

Evaluation of inactivity stiffness in minutes.

Measurement of range of motion of the knee, cervical and lumbosacral regions.

**Investigations:** Plain X-ray for both knees, cervical and lumbosacral regions postero-anterior and lateral views were done.

Occasional CT scan when needed. Rheumatoid factor, LE test, ESR and postprandial blood sugar.

**2-Psychiatric assessment:**

The following psychiatric measures were applied:

Rate degree of depression on the Hamilton Depression scale (Hamilton, 1960).

Beck Depression Inventory (BDI) was administered to and filled by each member of studied groups (Beck et al., 1961).

- Mini MMPI: was scored in the standard manner to yield 11 scale scores. Standard K-corrected T-scores were used through out (Kincanon, 1968). Mini MMPI T-scores are standardized to a mean of 50, and scores above 70 are greater than 2 standard deviations from the mean. Individual profiles were placed in one of 3 classes based on classifications noted by (Bradley, 1978 and Armentrout, 1982) in chronic pain patients.

Class 1: had no T-scores above 70

Class 2: had elevations above 70 for Hs, D or Hy (see table for abbreviation) but no other elevation.

Class 3: had other scale elevations.

In addition, 2 clinical psychologists blindly classified profiles into groups labeled "normal", "somatically concerned" and "psychologically disturbed". The normal group contained profiles with no more than one moderately elevated scale (T-score less than 75). The somatically concerned group had at least one scale of 75 or over on the Hs, D or Hy scales, or

2 or more scale elevations above 70 on these scales. The psychologically disturbed group contained profiles with at least 2 scale elevations over 70 on the pd, pa, pt, sc and ma scales.

**Statistical analysis:**

The statistical methods used were: The mean (X), standard deviation (SD), "t" test and analysis of variance (F-test) (Armitage, 1982).

**Results:**

Table (1) shows that the mean age onset of chronic pain patients of physical etiology was 42.93 years  $\pm$  8.20 with range between 33 to 55 years, while mean age onset of diopathic pain patients was 28 years  $\pm$  5.18 with range between 18 - 40 years. The difference between both groups was significant ( $P < 0.001$ ). Table (2) shows the mean Mini MMPI T-scores for each group along with Univariate F-ratios between cluster comparisons. There were significant differences across studied groups on 11 scales. Figure (1) shows Mini MMPI profiles, generated by plotting the studied groups scale means.

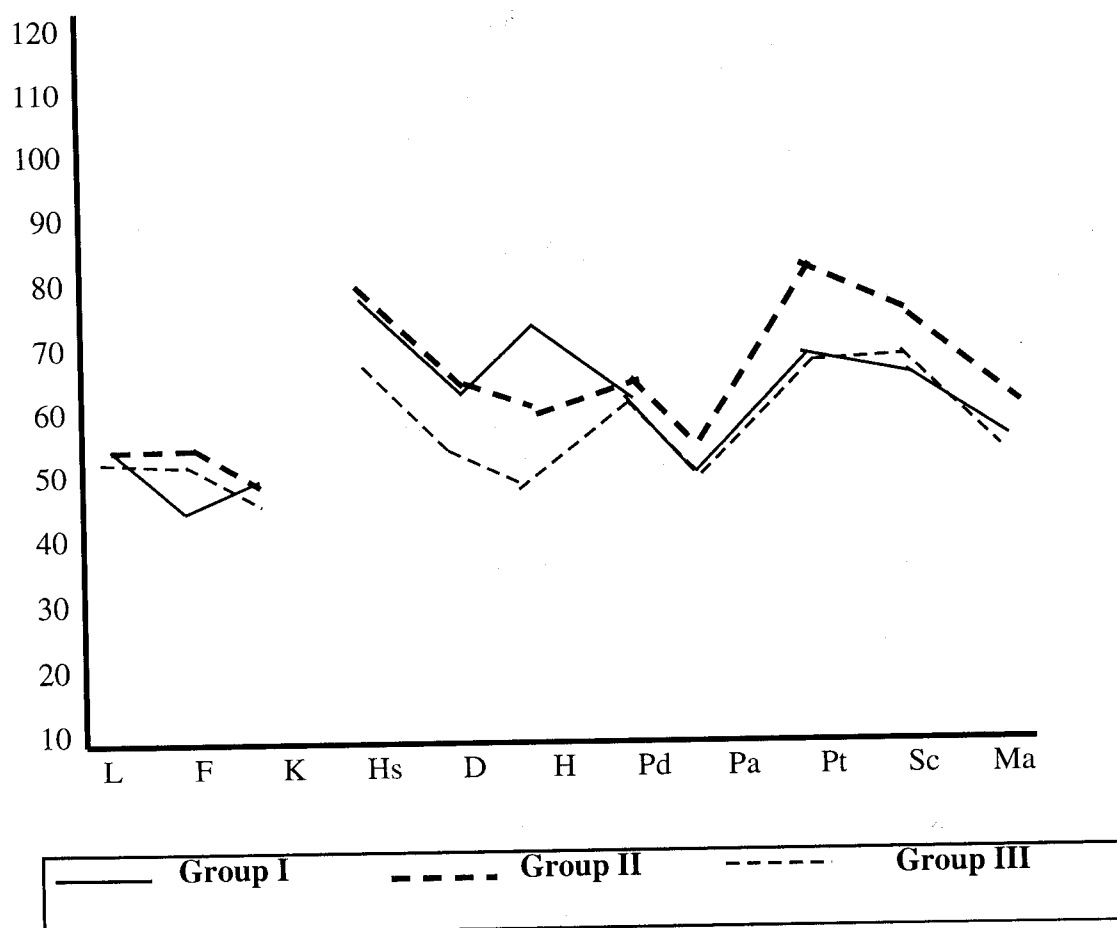
Table (3) shows significant differences between the three studied groups on BDI and Hamilton scales ( $P < 0.001$ ) respectively.

Group 2 showed higher scores on BDI ( $60.33 \pm 15.07$ ) than group 1 ( $59.25 \pm 14.97$ ) while on Hamilton scale

**Table (1): Age onset of pain in groups 1 and 2**

|          | Group1 | Group 2 | t    | P      |
|----------|--------|---------|------|--------|
| X        | 42.93  | 28      | 10.2 | <0.001 |
| $\pm$ SD | 8.70   | 5.18    |      |        |

**Fig (1) : Mean mini MMPI profile patterns for studied groups**



group 1 showed higher scores  $11.75 \pm 6.99$  than group 2 ( $6.87 \pm 3.15$ ).

As to grades of pain and tenderness, in idiopathic pain patients, they had pain of grades II and III which was not compatible with grades of tenderness, as grades of tenderness among them were 0 and I. While in organic pain patients, they had pain of grades I, II and III which were compatible with grades of tenderness.

Table (4) shows that there were significant differences between grades of pain among organic pain patients ( $P < 0.005$ )

on BDI scale. Patients who had grade II of pain ( $n = 18$ ) had higher scores on BDI scale ( $67.33 \pm 12.43$ ), while patients who had grade III of pain ( $N = 3$ ) had low scores on BDI scale. on Hamilton scale organic pain patients showed no significant difference.

On the other hand, duration of illness among patients in group I showed that, patients who had pain less than one year had scores on both BDI and Hamilton - ( $50.86 \pm 6.5$ ) and ( $7.5 \pm 4.5$ ) respectively lower than patients who had pain more than one year ( $65.78 \pm 16.5$ ) and ( $15.0 \pm 6.91$ ) respectively and there were signifi-

**Table (2) Mini MMPI T-scores means (k-corrected) among studied groups**

| Mini MMPI Sub-scales       | Group 1<br>(N=48)<br>X± SD | Group 2<br>(N=45)<br>X± SD | Group 3<br>(N=48)<br>X± SD | f     | P      |
|----------------------------|----------------------------|----------------------------|----------------------------|-------|--------|
| L (lie)                    | 56.4±3.63                  | 56.81±7.09                 | 53.06±10.38                | 10.5  | <0.001 |
| F (false)                  | 45.24±6.55                 | 55.81±9.7                  | 53.06±13.16                | 6.7   | <0.001 |
| K(Ego-strength)            | 49±5.27                    | 48.13±9.21                 | 46.56±9.35                 | 4.96  | <0.001 |
| Hs (Hypochondriasis)       | 77±7.98                    | 79.81±8.83                 | 64.5±9.99                  | 7.22  | <0.001 |
| D (depression)             | 65.63±10.1                 | 68.2±4.75                  | 51.44±6.36                 | 16.74 | <0.001 |
| H (hysteria)               | 70.53±7.72                 | 63.25±9.37                 | 47.5±10.36                 | 12.85 | <0.001 |
| Pd (psychopathic deviancy) | 62.13±7.05                 | 66.25±9.22                 | 59.75±9.94                 | 5.48  | <0.001 |
| Pa (paranoia)              | 49.67±10.07                | 56.44±10.83                | 49.38±8.04                 | 2.98  | <0.001 |
| Pt (psychoasthina)         | 69.47±7.81                 | 80.73±9.68                 | 67.25±6.15                 | 10.87 | <0.001 |
| Sc (schizophrenia)         | 66.2±9.60                  | 73.88±7.53                 | 68.13±8.71                 | 9.49  | <0.001 |
| Ma (hypomina)              | 54.4±8.11                  | 62±7.92                    | 51.56±8.82                 | 8.69  | <0.001 |

**Table (3) Comparison between psychometric results of studied groups**

| Studied groups             | Group 1<br>(N=48) | Group 2<br>(N=45) | Group 3<br>(N=48) | f    | P       |
|----------------------------|-------------------|-------------------|-------------------|------|---------|
| Applied scales             | X±SD              | X±SD              | X±SD              |      |         |
| Beck's questionnaire (BDI) | 59.25<br>±14.97   | 60.33<br>±15.07   | 37.56<br>±7.90    | 9.20 | < 0.001 |
| Hamilton                   | 11.75<br>±6.99    | 6.87<br>±3.15     | 4.13<br>±2.11     | 2.76 | < 0.001 |

**Table (4): Comparison between psychometric results of grades of pain in group 1**

| Studied groups       | Group 1<br>(N=48) | Group 2<br>(N=45) | Group 3<br>(N=48) | f    | P       |
|----------------------|-------------------|-------------------|-------------------|------|---------|
| Applied scales       | X±SD              | X±SD              | X±SD              |      |         |
| Beck's questionnaire | 55<br>±15.09      | 67<br>±12.43      | 49±0              | 3.4  | < 0.005 |
| Hamilton             | 12.22<br>±7.19    | 11.5<br>±7.41     | 8.33<br>±1.32     | 1.63 | 0.21    |

**Table (5): Comparison between psychometric results of duration of pain in group 1**

| Duration of pain     | Less than<br>one year<br>(N=21) | More than<br>one year<br>(N=27) | f    | P       |
|----------------------|---------------------------------|---------------------------------|------|---------|
| Applied scales       | X±SD                            | X±SD                            |      |         |
| Beck's questionnaire | 50.86<br>±6.5                   | 65.78<br>±16.5                  | 3.98 | < 0.002 |
| Hamilton             | 7.5±4.5                         | 15±6.91                         | 4.3  | < 0.002 |

**Table (6): Comparison between psychometric results of limitation of movement in group 1**

| Movement             | Unlimited<br>movement<br>(N=27) | Limited<br>movement<br>(N=21) | f    | P   |
|----------------------|---------------------------------|-------------------------------|------|-----|
| Applied scales       | X±SD                            | X±SD                          |      |     |
| Beck's questionnaire | 60.44<br>±15.59                 | 57.71<br>±14.35               | 0.63 | N.S |
| Hamilton             | 12.33±8.38                      | 10.90±4.88                    | 0.74 | N.S |

cant differences between both ( $P < 0.02$ ) and ( $P < 0.0002$ ) respectively, as in table (5).

As to limitation of movement, in group I (Table 6) shows that there were no significant differences between patients who had limited movement and patients who had not on BDI and Hamilton scales.

N.B. In group 2, patients had no limitation of movement.

**Discussion:** There are several significant results of our study. First we found significant differences between mean age onset of chronic pain patients with organic etiology ( $42.93 \pm 8.70$ ) and chronic pain patients without organic etiology ( $28 \pm 5.18$ ) this indicates that organic disease increases with age as reported by (Lewis, 1989) who stated that degenerative disease (e.g. cervical spondylosis) increase in each decade of life. Moskowitz (1993) who stated that age onset of osteoarthritis was more than 38 years.

Kaplan et al. (1990) reported that psychogenic (somatoform) pain begins before the age of 30 and is rare in men, as in our patients (who had functional pain) were all females.

According to our results, we had three Mini MMPI profiles, they are; normal profile as in our control group, somatically concerned profile as in chronic pain patients and psychologically disturbed profile as in functional chronic pain patients.

So, we found that chronic pain patients were somatically concerned [elevations on Hs and Hy (T. scores above 70)] this confirmed by Bradley et al. (1978) who found elevations on scales Hs, D and Hy among chronic pain pa-

tients when compared to normal control. This was replicated in other low back pain population Hart (1984) as well as in samples with diverse pain problems (Armentrout et al., 1982).

This study showed that patients complaining of pain without organic etiology had Mini MMPI profile different from organic pain patients (Fig. 1). The functional chronic pain patients - in addition to be somatically concerned - were psychologically disturbed, and this result tend to indicate presence of psychiatric disorders and that chronic pain may be an expression of chronic psychiatric illness that precedes the offset of chronic pain syndrome, so this point is in need of further research.

Prevalence of depression among chronic pain patients is in accord with other studies of depressive illness in chronic pain (Katton et al., 1985 and Fishbain et al., 1986). Gatchel et al. (1994) reported that the most prevalent axis I diagnosis was major depression in chronic pain patients.

Elevated level of depression among chronic pain patients (both organic and functional) due to, somatic symptoms of depression. As regard pain severity, we found that as pain severity increases the more prevalence of depression - except in patients with grade III of pain, this may be due to small numbers of this subgroup of patients ( $n = 3$ ).

This is in agreement with Chandrana et al. (1987), who found that depression scores were positively correlated with pain, and Parker et al. (1988) found that pain severity was significantly related to functional disability. While in other studies worsening depression was not associated with pain or disability Howley et al. (1988). Thus the patients who complain most of pain and are excessively

concerned about their illness are not necessarily those who have the most active and disabling disease but are those who have anxiety and depression (Francis, 1990). With increase duration of pain, there are numerous clinic attendance, with financial problems, impairment of social contact and disability of the disease, this make patient more liable to depression. King et al. (1991) stated that the patient may become depressed, angry, somatically preoccupied, and progressively sedentary as the pain experience becomes chronic.

On the other hand, other studies were unable to find significant correlation between degree of depression and duration of severity of pain (among patient with arthritis) (Zaphirapouls and Burry, 1974 and Bishop et al., 1987). There is evidence that perceived limitation and disruption of activity in chronic pain syndromes is strongly associated with the degree of emotional disturbance (Waliboff et al., 1983). While, Hawely and Wolf (1988) found no association between depression and disability and this result is parallel to our finding as there was no significant correlation between depression and limitation of movement.

### Recommendations

Patients complaining of chronic pain syndrome must be subjected to psychological management as well as physical management, so that appropriate treatment can be applies. Further studies to detect psychiatric disorders among idiopathic chronic pain patients which may be an, expression of chronic psychiatric illness or psychological problems that precedes the onset of chronic pain syndrome.

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## خصائص الشخصية و الإكتئاب لدى المرضى الذين يعانون من الام مزمنه

كان الهدف من هذه الدراسة هو محاولة التعرف على الفروق فى خصائص الشخصية بين الذين يعانون من الام مزمنه ناتجة عن أسباب عضوية و تلك الناتجة عن أسباب غير عضوية و كذلك تقييم درجة الإكتئاب بين مجموعات البحث و اكتشاف العلاقة بين الإكتئاب وشدة الألم ومدته و تقييد الحركة.

ولتحقيق هذا الهدف تم اختبار ٤٨ مريضاً بالألم نتيجة لأسباب عضوية و ٤٥ مريضاً بالألم بدون أسباب عضوية (وذلك من العيادة الخارجية للطب الطبيعى و التأهيل بمستشفى الزقازيق الجامعى) و ٤٨ شخصاً لا يعانون من أى ألم كعينة ضابطة.

وتم عمل فحص عضوى إكلينيكي لتشخيص المرض ومعرفة الأسباب العضوية المسببة للألم وذلك بعمل أشعة عادية (منظر خلفى-امامى) على الفقرات العنقية والقطنية والركبية وأشعة مقطعية ام لزم الأمر وكما تم تطبيق ثلاثة اختبارات هى اختبارات نفسية الشخصية المتعدد الأوجه المختصر و اختبار بك و اختبار هاملتون للاكتئاب .

وأظهرت الدراسة النتائج التالية:  
إتخذت خصائص الشخصية للمرضى الذين يعانون من ألام مزمنه ناتجة عن أسباب عضوية صوره مماثله لما وجد فى الدراسات السابقة كما ظهر من بروفيل مرضى الالم (الوظيفى) الذى ليس له سبب عضوى انهم يعانون من اضطراب نفسى.  
كما اثبتت وجود علاقة ذات دلالة احصائية بين الإكتئاب والألم وشده ومدته بينما لم توجد علاقة بين الإكتئاب و تقييد الحركة نتيجة للألم.