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### Scientific and Technological Research

## Variables associated with the risk of suicide in patients with chronic pain seen in a hospital outpatient clinic in Bogotá<sup>☆</sup>

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#### ABSTRACT

**Introduction:** The primary objective of this research is to determine the relationship between anxiety, depression, quality of life and the risk of suicide in patients with chronic pain.

**Method:** Cross-sectional descriptive-correlational study of a consecutive sample taken from a census of the total population seen between December 2011 and January 2012. The sample included 49 patients of the El Tunal Hospital Pain Clinic in Bogotá. The following measurement tools were used: Health-Related Quality of Life (SF-36), Hospital Anxiety and Depression Scale, the Plutchik suicide risk scale and numeric pain scale.

**Results:** It was found that the largest percentage of the population (75%) perceived pain at a moderate-to-severe level; 34% were at risk of suicide and 25% had suicidal ideation. In terms of quality of life, the majority of patients felt that they were limited in their ability to move and perform physically demanding tasks; 75.5% of patients had experienced anxiety symptoms and 61.2% had symptoms of depression. Finally, there was no correlation between the risk of suicide and the perceived levels of pain. Significant associations were found between the risk of suicide and anxiety, depression, mental health, mental component, vitality and emotional role.

**Conclusion:** There is a need to undertake research designed to determine mediators between pain and emotional status, considering that this understanding appears to be crucial for improving the effectiveness of the interventions in these patients.

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## VARIABLES ASOCIADAS A RIESGO DE SUICIDIO EN PACIENTES CON DOLOR CRÓNICO ATENDIDOS POR CONSULTA EXTERNA EN UN HOSPITAL DE BOGOTÁ

### RESUMEN

#### Palabras clave:

Calidad de vida  
Ansiedad  
Dolor  
Ideación suicida

**Introducción:** Esta investigación tiene como objetivo principal determinar la relación entre ansiedad, depresión, calidad de vida y riesgo suicida en pacientes con dolor crónico.

**Método:** Corresponde a un estudio de tipo descriptivo-correlacional y de corte transversal, con un censo del total de población atendida entre diciembre de 2011 y enero de 2012, bajo un muestreo consecutivo. La muestra estuvo conformada por 49 pacientes de la Clínica de Dolor del Hospital El Tunal de Bogotá (Colombia). Se usaron los siguientes instrumentos de medición: Calidad de vida relacionada con la salud (SF-36), Escala hospitalaria de ansiedad y depresión (HAD), Escala de riesgo de suicidio de Plutchik y Escala analógica numérica de dolor.

**Resultados:** Se encontró que el mayor porcentaje de la población (75%) percibe un nivel de dolor entre moderado y severo; el 34% presenta riesgo suicida, y el 25% ideación suicida; en cuanto a la calidad de vida, la mayor parte de los pacientes sienten limitaciones en su capacidad de desplazamiento y realización de esfuerzos físicos; el 75,5% de los pacientes presentan síntomas de ansiedad y el 61,2%, de depresión. Finalmente, el riesgo de suicidio no se relacionó con los niveles de dolor percibido. Se encontraron asociaciones significativas entre riesgo de suicidio con ansiedad, depresión, salud mental, componente mental, vitalidad y rol emocional.

**Conclusión:** Se plantea la necesidad de realizar investigaciones que permitan determinar los mediadores entre el dolor y los estados emocionales, pues este parece ser un aspecto central a comprender para mejorar la efectividad de las intervenciones en estos pacientes.

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## Introduction

According to IASP (International Association for the Study of Pain) pain is defined as an “unpleasant sensory and emotional experience associated with real or potential tissue injury, or described in terms of such damage”<sup>1</sup>; the experience as perceived by the subject is complex, affecting all dimensions (emotional, cognitive, physical, spiritual, and work, family and social life).<sup>2</sup>

According to the duration, pain has been classified as acute (less than 3 months) and chronic (more than 3 months).<sup>1</sup> Bonica (1990) restated this definition and described chronic pain as that which “lasts for more than one month beyond the normal course for recovery, is associated with a chronic disease process, or reappears at intervals of months or years”.<sup>3</sup> Pain intensity is determined on the basis of the patient’s report on a 1–10 numerical scale, where 1–3 is mild, 4–6 is moderate, and 7–10 is severe.<sup>1</sup>

Among the consequences of pain, anxiety and depression are some of the most commonly reported emotional responses in patients with chronic pain. They give rise to intense elaboration of catastrophic thoughts, intensifying pain perception.<sup>4</sup> Moreover, research reveals that many chronic pain sufferers show reduced mobility and slower movements, usually resulting in greater atrophy of the affected body part and pain intensification.<sup>5</sup>

Pain experience has been treated mainly from the medical perspective, with a focus on the physiological process, without bearing in mind the importance of intervening on the emotional component and the psychological suffering, which are

significant disruptors of quality of life and recovery, and are even associated with suicidal ideation in certain instances.<sup>6</sup>

In view of the above, the proposed objective is to determine the relation between anxiety, depression, quality of life perception and risk of suicide in patients with chronic pain coming to the outpatient pain clinic at El Tunal Hospital in Bogotá D.C. The idea is to create awareness about the problems affecting these patients and the impact of chronic pain on this population.

Considering that suicidal ideation is a precursor to suicide attempts, this research is important because it will shed light on actions that may help prevent self-inflicted death and improve psychological interventions.

## Methods

### Design

Cross-sectional, descriptive correlational study.

### Subject selection and description

**Inclusion criteria:** Spanish speaking Colombian national adults with a diagnosis of chronic pain non-secondary to an end-stage disease, who came to the outpatient pain clinic of El Tunal Hospital in Bogotá during the study period, and agreed to participate voluntarily in the study.

**Exclusion criteria** were: being in the process of filing for pension or indemnity payment by an institution due to pain, and inability to respond to the tests due to cognitive

impairment or altered sensory perception. These criteria were established in order to reduce the probability of bias in variable measurements due to potential malingering by this type of patients.

Consecutive sampling was proposed because this method ensures that sample representativeness is similar to that obtained with probabilistic sampling.<sup>7</sup>

### Sample size

Sample size was calculated for the association between the risk of suicide risk and the quality of life, anxiety and depression variables. Considering that the expectation was to perform 12 correlations in data analysis, the stated confidence interval (alpha) was corrected using the Bonferroni correction.<sup>8</sup> With the correction, an acceptable margin of error of 0.004 was obtained for each association, thus maintaining the overall confidence level of 0.05 for the study.

A sample size of 38 patients was estimated using the Epidat 4.0<sup>®</sup> software, for a 99.9% confidence interval, a power of 80%, and a significant association of 0.6. This calculation was corrected taking into consideration that the relative efficiency of the Spearman correlation, compared with Pearson's, is 0.91,<sup>9</sup> and it was increased by 10% to account for potential losses. Finally, the suggested minimum sample size calculated for this study was 46 subjects.

A census of the total population seen between December and January 2011 and 2012 that met inclusion and exclusion criteria was used, because the number of patients seen was not very high and a large percentage were diagnosed with end-stage disease. Therefore, given the resources available and the time of the study, it was decided to collect the largest amount of data that met the sample size requirement for the correlation analysis. A total of 49 patients were ultimately evaluated.

### Tools

#### *Health-Related Quality of Life Questionnaire (SF-36)*

The SF-36 is designed to evaluate health-related quality of life (HRQoL), and consists of 36 items grouped in 8 sub-scales. It was found to offer acceptable validity and reliability results for application in Colombia.<sup>10</sup> The scoring system is based on T scores with a mean of 50 and a standard deviation of 10 for each sub-scale.

#### *Hospital Anxiety and Depression Scale (HAD)*

The HAD is two-dimensional scale that allows to screen for anxiety and depression symptoms in the hospital setting. It consists of 14 items, with Likert-type responses between 0 and 3. In Colombia, this scale was also shown to have acceptable validity and reliability.<sup>11</sup> Score classification in the sub-scales (anxiety/depression) are normal from 0 to 7, doubtful from 8 to 10, and clinical problem when the score is 11 or more.

#### *Plutchik Suicide Risk Scale*

This scale was designed by Robert Plutchik with the aim of separating suicidal patients from those who are not. It consists of 15 YES or NO questions. The Spanish version was validated by Rubio et al.<sup>12</sup> It evaluates prior suicide attempts, the intensity of current suicidal ideation, and feelings of depression and

hopelessness. The original scale showed a consistency of 0.84 (Cronbach's alpha) and in the Spanish validation, Cronbach's alpha reached values of 0.90; and for the Spanish test-retest reliability, it was found that there was a pre- and post-test correlation of 0.89 after 72 hours. In this validation, the cut-off point proposed is 6, for 74% sensitivity and 95% specificity to discriminate between controls and patients (suicidal attempts and personality disorders). With the same cut-off point, sensitivity and specificity are 88% for discrimination between the subjects with a history of suicide attempt and those with no prior attempts. There is no validation of this scale for Colombia.

#### *Analog Numeric Pain Scale*

A 0-10 numeric scale was used to assess pain intensity, where 0 is no pain and 10 is the worst possible pain. Questions were asked about intermediate, highest and lowest pain level perceived over the previous week and the pain level at the time of assessment.

### Ethical considerations

The study was approved by the El Tunal Hospital ethics and research committee. The most important recommendation, actually accomplished, was to refer all patients with a risk of suicide, potential anxiety or depression immediately to the mental health service and to inform the treating physician.

### Analysis

Frequencies, central trends and scatter were estimated for the variables measured; associations were also analyzed between the suicide risk variable and the other variables, using the Epidat 4.0<sup>®</sup> and SPSS 18.0<sup>®</sup> analytical software packages.

The following calculations were performed in order to determine whether associations existed between the Quality of Life and Suicide Risk variables: Spearman correlations between the scores obtained in each of the sub-scales of the SF-36 and the score on the Plutchik Risk of Suicide scale; the Mann-Whitney *U* test to determine if there was a significant difference in the sub-scale scores between the groups with or without a risk of suicide, and with or without suicidal ideation.

The Chi square or Fisher's exact test were calculated in order to determine the association between anxiety, depression and suicide risk depending on whether the assumption of a minimum expected frequency of 5 was achieved in 80% of the boxes; additionally, correlations between scale scores were also calculated.

### Results

Overall, 49 patients were assessed in a group made up mostly by females (63.3%), the majority of them of the income brackets 1 and 2, predominantly with primary school education, and housewives as their main occupation. The most frequent cause of pain was an underlying disease (46.9%), primarily fibromyalgia, failed back, and post-operative pain mainly from hernia repairs and back surgery. The mean age was 57.8 years (SD 14.3) with a range between 22 and 92, and the majority

**Table 1 – Social and demographic data of the sample (frequencies and percentages).**

N = 49	F (%)
<b>Gender</b>	
Males	18 (36.7%)
Females	31 (63.3%)
<b>Age (m = 57.8; SD = 14.3)</b>	
20–39	5 (10.2%)
40–59	22 (44.9%)
60–79	20 (40.8%)
80 or more	2 (4.10%)
<b>Income bracket</b>	
0	1 (2.00%)
1	17 (34.7%)
2	27 (55.1%)
3	4 (8.10%)
<b>Education</b>	
No schooling	8 (16.3%)
Primary	27 (55.1%)
Incomplete secondary	10 (20.4%)
Secondary	3 (6.10%)
Tech/Technol/Univer	1 (2.00%)
<b>Work</b>	
Unemployed	12 (24.5%)
Housewife	24 (49.0%)
Self-employed	10 (20.4%)
Employee	3 (6.10%)
<b>Cause of pain</b>	
Trauma	7 (14.3%)
Disease	23 (46.9%)
Post-operative	14 (28.6%)
Does not know	5 (10.2%)

Source: Authors.

were adults or elderly patients (Table 1). Patients failed to answer some items in some of the scales and, therefore, the results exclude the data lost in each case.

It is noteworthy that in all measurements, pain levels were mostly moderate or severe. When the highest level of pain perception was considered, the inter-quartile range showed that 75% of the subjects reported values above 7, considered severe; this means that over the previous week most of the subjects had experienced very high levels of pain (Table 2). Additionally, the frequency for each pain level was calculated (mild, moderate and severe), and the result was that 80% of the population assessed had experienced moderate or severe pain during the previous week (Table 3).

In terms of quality of life, there was an overall decline in work and daily activities. The mean value on the Physical

**Table 3 – Frequency and percentage of pain levels perceived by the patients assessed.**

	Frequency	Percentage
No pain	1	2%
Mild	8	16.3%
Moderate	22	45%
Severe	18	35%

Source: Authors.

Role scale (25.1) is quite low, and the median indicates that 50% of people perceived a functional decline three standard deviations below the expected mean (50). This indicates that patients had had problems with their work and daily activities over the previous month. In terms of physical functioning, this scale assesses mobility, ability to move and ability for physical exertion, and results show evidence of decline considering that the mean for the population (32.7) is almost two standard deviations below the expected mean. In terms of pain, the degree of limitation for daily activities was assessed in relation to pain intensity, resulting in a mean value of 32.6 and a median of 32.5. This means that these results are almost two standard deviations below the expected mean (50), a low score showing limitations in activities of daily living as a result of pain. The emotional role sub-scale assesses difficulties with work and other activities due to emotional issues, and the mean value was 22.7 (SD: 16), which places this result almost three standard deviations below the expected mean. This indicates that patients perceived that their emotional problems hindered work and other activities. For the physical component, a significant decline in physical function was identified, considering that the average score (33.8 with a SD of 9) is low (Table 4).

In terms of anxiety and depression symptoms, results show that the largest percentage of people that completed 100% of the test exceeded the cut-off point of 11, meeting the criteria required for suspected anxiety (75.5%) and depression (61.2%) (Table 5). Data analysis for the risk of suicide revealed that 39% of the population had a risk of suicide and 25% had suicide ideation (Table 6).

Analyses found significant inverse relationships between the suicide risk scale and the scores obtained for the SF-36 subscales of vitality, mental health, and the health component. Of these, a strong association was found with mental health and the mental component, and the relationship with vitality was also an important consideration. This result shows that patients with feelings of anxiety and depression and with a greater decline in activity as a result of mental health have higher scores on the suicide risk scale, and this relationship

**Table 2 – Pain level perceived by the patients assessed.**

	Median	Inter-quartile range	Minimum	Maximum
Highest pain level perceived over past week	9	7 to 10	1	10
Lowest pain level perceived over past week	4	2 to 6	0	10
Average pain level perceived over past week	6	4 to 8	0	10
Pain level at the present time	4	3 to 7	0	10

Source: Authors.

**Table 4 – Result on SF-36 sub-scales.**

	Mean	SD	Median	CI	Min	Max	Lowest score interpretation (0)	Highest score interpretation (100)
Physical function	32.7	9.4	33.8	25–40	15	48.6	Very impaired for all physical activities, including bathing.	Performs all types of physical activities with no impairment.
Physical role	25.1	13.3	17.6	17–27	18	56.8	Problems with work or other activities of daily living	No problem with work or other activities of daily living
Pain	32.6	8.6	32.5	24.9–37.4	19.9	55.4	Very intense pain and extremely limiting	No pain or impairment
Emotional role	22.7	16	24.8	9.2–24.8	9.2	55.9	Problems with work and other ADL due to emotional issues	No problem with work or other ADL due to emotional issues
Physical component	33.8	9.0	32.9	27–39	18	53.1	Significant decline in functioning due to physical health	

Source: Authors.

**Table 5 – Frequency and percentage of patients with symptoms considered as indicators of anxiety and depression.**

Variable	Frequency	Percentage
<b>Anxiety</b>		
Yes	37	75.5
No	7	14.3
Lost data	5	10.2
<b>Depression</b>		
Yes	30	61.2
No	16	32.7
Lost data	3	6.1
<b>Total</b>	<b>49</b>	<b>100</b>

Source: Authors.

**Table 6 – Frequency and percentage of patients with and without a risk of suicide.**

	Frequency	Percentage
Without risk	24	49%
With Risk	19	39%
Lost data	6	12%
<b>Total</b>	<b>49</b>	<b>100%</b>

Source: Authors.

may be similar, although not as strong, among those who feel tired and exhausted most of the time (Table 7).

When the dichotomous analysis was applied to the results, a significant association was found between depression and the risk of suicide (Table 8), just like the correlation is high and significant when the direct scores obtained on the correlation scale are considered (Table 9). Regarding the anxiety variable, the dichotomous analysis did not find association between anxiety and the risk of suicide. However, when direct scale scores are considered, the correlation is intermediate and significant (Table 9).

**Table 7 – Correlation between SF 36 and the Plutchik Risk Suicide Scale.**

	Suicide risk	
	Spearman correlation	Sig.
Physical function	–0.108	0.490
Physical role	–0.141	0.368
Pain	–0.244	0.113
Overall health	–0.390	0.010
Vitality	–0.461*	0.002
Social functioning	–0.191	0.219
Emotional role	–0.412	0.006
Mental health	–0.563*	0.000
Physical component	–0.073	0.642
Mental component	–0.529*	0.000

Source: Authors.

\* Significant with  $p \leq 0.004$ .

## Discussion

The study found a high prevalence of suicide risk and ideation, where 34% of the patients were found to have a risk of suicide, and 25% reported suicidal ideation. These findings are similar to those reported by Smith, Perlis & Haythornthwaite,<sup>13</sup> who reported that 24% of their patients had suicidal ideation.

In terms of patient perception of quality of life, it was found that the majority of patients (median = 33.8) feel that they are limited in their ability to engage in physical activities such as long walks, shopping or climbing stairs, i.e. in their ability to move and engage in physical exertion; however they perceive that the compromise is much greater (median = 17.6) when it comes to their work or activities of daily living such as house work. This latter finding is quite significant because 75% had scores under 27, and considering that scores range from 0 to 100, a score of 27 on the Physical Role scale is evidence of significant compromise. The impact on the functional level might be related to the reported levels of pain, since according to the

**Table 8 – Depression – Suicide Risk Contingency Table.**

	Suicide risk			Chi square*
	Without risk	With risk	Total	
<i>Depression</i>				
No	11	2	13	6.825
Yes	11	16	27	Sig:
Total	22	18	40	0.009
Lost values			9	

Source: Authors.

\* 0 fields (0%) have an expected frequency of less than 5. The lowest expected frequency is 5.85.

**Table 9 – Correlation between HAD scores and the Plutchik Suicide Risk Scale.**

	Total score for suicide
<b>Spearman Rho</b>	
<i>Anxiety</i>	
Corr Coeff	0.515**
Sig. (bilateral)	0.001
N	39
<i>Depression</i>	
Corr Coeff	0.613**
Sig. (bilateral)	0.000
N	40

Source: Authors.

\*\* Significant with  $p \leq 0.001$ .

results from authors like González et al.,<sup>14</sup> Padierna et al.<sup>15</sup> and Soler et al.,<sup>16</sup> pain diminishes normal function ability in pain sufferers, which is consistent with the results of this study.

A high emotional impact was found, showing that most of the subjects assessed had a perception of difficulty with work and other activities of daily living due to emotional problems, and reported experiencing feelings of anxiety and depression most of the time. This result in the SF-36 correlates with scores on the HAD, where 75.5% of patients reported anxiety symptoms, including fear, nervousness and stress. Regarding depressive symptoms, it was found that 61.2% exceeded the cut-off point and could be suffering from this disorder. Authors like Truyols et al.<sup>3</sup> assert that depression is one of the emotional responses most commonly associated with pain, and that symptoms may also manifest in the form of depression episodes; in that research, the authors also concluded that anxiety and depression symptoms are associated with a significant increase in pain perception.

Finally, the most important objective of this study was to determine the association between the variables measured and the risk of suicide in the patients. It was found that suicide risk is not related to the levels of perceived pain; however, there was no difference between the levels of pain or disability between depressed patients with our without suicidal intention. In this sense, it could be argued that it is not pain per se that might result in suicidal ideation or suicide risk among the subjects assessed, but rather the emotional impact of pain. In fact, all the significant associations were found between suicide risk and anxiety, depression, emotional role, mental health and mental component. Hence, it could be argued that

pain has an emotional impact which, according to patient perception, affects normal functioning, and has an important relation with suicide risk.

### Contextualization of findings and conclusions

Bearing in mind that this is an observational cross-sectional study, it is not possible to generalize, and causal factors or directionality of the associations cannot be determined. Despite precluding generalizations due to the particular type of sample, it is generally considered that the findings serve as an initial approach to the problem. The results point to the need of conducting future studies to determine mediators between pain and emotional states, since it appears that this understanding is critical in order to improve the effectiveness of the interventions and reduce risks associated with anxiety and depression, including suicide risk. Finally, we believe that it is important to include assessment and care of the mental component and emotional states in all protocols and care guidelines for chronic pain.

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### Conflicts of interest

The authors have no conflicts of interest to declare.

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