

# Exploration of Anger Constructs in Acute and Chronic Pain Patients versus Community Patients

David A. Fishbain, MD, F.A.P.A. • John E. Lewis, Ph.D. • Daniel Bruns, Psy.D. • John Mark Disorbio, Ed.D. • Jinrun Gao, M.S., M.B.A. • Laura J. Meyer, Ph.D.

## ABSTRACT

**Introduction:** Chronic pain patients (CPPs) are generally reported to be angry but these reports are limited by lack of appropriate control groups. CPP anger has been shown to be associated with the wish to sue<sup>1</sup> and violent ideation against<sup>2</sup> physicians.

**Objectives** of this study were (a) Determine and compare the prevalence of forms of anger (FOA; anger, hostility, aggression, anger-in, anger-out, chronic anger) in community non-patients (n=478), community patients (n=158), acute pain patients (APPs, n=326), CPPs (n=341); and (b) Develop FOA predictor models for APPs/CPPs.

**Methods:** A large set of variables including the FOA items was administered to the above groups who were compared for FOA endorsement. APPs and CPPs affirming the anger and chronic anger items were compared to those not affirming on

all available variables with significant variables (p<0.001) entered into predictor models.

**Results:** FOA affirmation ranged from 8.28% for chronic anger in non-patients to 37.54% for anger in CPPs. Only CPPs were more likely to affirm anger (p<0.04) and chronic anger (p<0.01) than community patients. Hostility was the strongest predictor for anger and chronic anger in CPPs and APPs and all models predicted these FOAs better than the base rate prediction.

**Conclusions:** Anger and chronic anger are more frequently found in CPPs versus community patients supporting the clinical perception that many CPPs are angry. Clinicians should actively screen CPPs for these FOAs in order to engage these patients in anger management treatment.

## RESULTS

**Relative Risk of Affirmation for the Six FOA (Table 1).** CPPs typically had the highest risk for each FOA. CPPs were significantly more likely to endorse “anger” and “chronic anger.” APPs were not significantly more frequently likely than community patients to endorse any of the FOAs.

**Final Logistic Regression Models to Predict “Anger” as the Dependent Variable with Significant Independent Variables for APPs and CPPs (Table 2).** For APPs, the final model chi-square was significant ( $\chi^2 = 112.7[4]$ , p < 0.001) and explained 43% of the variance in the dependent variable according to Nagelkerke R<sup>2</sup>. The model overall classified 77% of the subjects correctly, which was significantly above the base rate prediction of 64.4%. Sensitivity of the model was 57% and specificity was 88%.

For CPPs, the final model chi-square was significant ( $\chi^2 = 133.0[3]$ , p < 0.001) and explained 46% of the variance in the dependent variable according to Nagelkerke R<sup>2</sup>. The model overall classified 78% of the subjects correctly, which was significantly better than the base rate prediction of 62.5%. Sensitivity of the model was 63% and specificity was 87%.

**Final Logistic Regression Models to Predict “Chronic Anger” as the Dependent Variable with Significant Independent Variables for APPs and CPPs (Table 3).** For APPs, the final model chi-square was significant ( $\chi^2 = 112.6[7]$ , p < 0.001) and explained 62% of the variance in the dependent variable according to Nagelkerke R<sup>2</sup>. The model overall classified 92% of the subjects correctly, which was significantly above the base rate prediction of 87.7%. Sensitivity of the model was 47% and specificity was 97%.

For CPPs, the final model chi-square was significant ( $\chi^2 = 123.8[5]$ , p < 0.001) and explained 50% of the variance in the dependent variable according to Nagelkerke R<sup>2</sup>. The model overall classified 86% of the subjects correctly, which was above the base rate prediction of 80.4%. Sensitivity of the model was 48% and specificity was 96%.

unique variables as being predictive for general and chronic anger: anxiety, perseverance, somatization, and borderline characteristics. It is well accepted that borderline syndrome is associated with significant emotional expression of anger.<sup>9</sup>

The developed models are potentially clinically useful for identifying general anger and chronic anger in APPs and CPPs as both models predicted these variables at significantly greater rate than the base rate prediction.

It is to be noted that for all 4 models, the sensitivity of the models was significantly lower than the specificity which in all 4 models was extremely high.

The results of this study indicate that clinicians should actively screen CPPs for the presence of anger in order to engage these CPPs in anger management treatment.

Our models identified some new and

## DISCUSSION/SIGNIFICANCE

In support of previous literature, this study has demonstrated that CPPs are more angry than controls (community patients) and APPs but only for specific types of anger: general anger and chronic anger.

In support of the theoretical underpinnings for anger, the BHI 2 hostility scale was the strongest predictor for general anger and chronic anger in both APPs and CPPs.

| TABLE 1.  |       |                                   |   |  |   |  |                                       |
|---|-------|-----------------------------------|---|--|---|--|---------------------------------------|
| Relative Risk of Endorsing FOAs For Community Non-Patients, Community Patients, APPs, and CPPs and Comparisons of Frequency of Endorsement for each item between Community Patients, APPs, and CPPs |       |                                   |   |  |   |  |                                       |
|   | N     | Yes to Anger n (%)<br>RR (95% CI) | Yes to Chronic Anger n (%)<br>RR (95% CI) | Yes to Aggression n (%)<br>RR (95% CI) | Yes to Anger Management In n (%)<br>RR (95% CI) | Yes to Anger Management Out n (%)<br>RR (95% CI) | Yes to Hostility n (%)<br>RR (95% CI) |
| Community Non-Patient   | 1,329 | 427 (32.1%)<br>1.00               | 110 (8.3%)<br>1.00                        | 384 (28.94%)<br>1.00                   | 327 (24.6%)<br>1.00                             | 349 (26.3%)<br>1.00                              | 125 (9.4%)<br>1.00                    |
| Community Patients  | 158   | 45 (28.5%)<br>0.89 (0.68, 1.15)   | 17 (10.8%)<br>1.30 (0.80, 2.11)           | 49 (31.0%)<br>1.07 (0.84, 1.38)        | 40 (25.3%)<br>1.03 (0.78, 1.37)                 | 45 (28.5%)<br>1.08 (0.83, 1.41)                  | 29 (18.4%)<br>1.95 (1.35, 2.82)       |
| Acute Pain Patients   | 326   | 116 (35.6%)<br>1.11 (1.04, 1.31)  | 40 (12.3%)<br>1.48 (1.05, 2.08)           | 115 (35.3%)<br>1.22 (1.03, 1.45)       | 96 (29.5%)<br>1.20 (0.99, 1.45)                 | 90 (27.6%)<br>1.05 (0.86, 1.28)                  | 42 (12.9%)<br>1.37 (0.99, 1.90)       |
| Chronic Pain Patients   | 341   | 128 (37.5%)<br>1.17 (1.00, 1.37)  | 67 (19.7%)<br>2.37 (1.80, 3.14)           | 112 (32.8%)<br>1.14 (0.94, 1.35)       | 96 (28.2%)<br>1.14 (0.94, 1.39)                 | 113 (33.1%)<br>1.26 (1.06, 1.50)                 | 61 (17.9%)<br>1.90 (1.43, 2.52)       |
| Z score and p value between Community Patients and Acute Pain Patients  |       | z = 1.59, p = 0.11                | z = 0.49, p = 0.62                        | z = 0.94, p = 0.35                     | z = 0.96, p = 0.33                              | z = 0.20, p = 0.84                               | z = 1.52, p = 0.13                    |
| Z score and p value between Community Patients and Chronic Pain Patients  |       | z = 2.04, p = 0.04                | z = 2.72, p = 0.01                        | z = 0.41, p = 0.68                     | z = 0.67, p = 0.50                              | z = 1.06, p = 0.29                               | z = 0.12, p = 0.90                    |

| TABLE 2.   |                        |   |                                |                |                        |              |               |            |                             |                             |
|--|------------------------|---|--------------------------------|----------------|------------------------|--------------|---------------|------------|-----------------------------|-----------------------------|
| Final Model Logistic Regression Results for Significant Independent Variables with “Anger” as the Dependent Variable for APPs and CPPs |                        |   |                                |                |                        |              |               |            |                             |                             |
| Step   | $\chi^2$ (df), p value | % of Cases Predicted Correctly by the Model | Step Nagelkerke R <sup>2</sup> | Variable       | Associated BHI-2 Scale | B            | Wald, p value | Odds Ratio | Lower 95% CI for Odds Ratio | Upper 95% CI for Odds Ratio |
| ACUTE PAIN PATIENTS  |                        |   |                                |                |                        |              |               |            |                             |                             |
| 75.1 (1), <0.001   | 73.6                   | .304  | Hostility Scale                | Not applicable | 0.17                   | 36.6, <0.001 | 1.18          | 1.12       | 1.25                        |                             |
| 19.3 (1), <0.001   | 73.9                   | .066  | Fighting with loved ones       | Borderline     | 1.87                   | 18.5, <0.001 | 6.51          | 2.77       | 15.26                       |                             |
| 11.2 (1), 0.001  | 77.3                   | .037  | Distrust of most people        | Hostility      | -1.53                  | 11.7, 0.001  | 0.22          | 0.09       | 0.52                        |                             |
| 7.0 (1), 0.008   | 76.6                   | .023  | Fear of dying                  | Anxiety        | 0.84                   | 7.0, 0.008   | 2.31          | 1.24       | 4.28                        |                             |
| CHRONIC PAIN PATIENTS  |                        |   |                                |                |                        |              |               |            |                             |                             |
| 112.4 (1), <0.001  | 77.3                   | .400  | Hostility Scale                | Not applicable | 0.15                   | 45.6, <0.001 | 1.16          | 1.11       | 1.21                        |                             |
| 11.5 (1), 0.001  | 76.7                   | .034  | Having patience                | Perseverance   | -1.00                  | 10.5, 0.001  | 0.37          | 0.20       | 0.67                        |                             |
| 9.1 (1), 0.003   | 78.3                   | .026  | Lack of initiative             | Perseverance   | 0.86                   | 8.9, 0.003   | 2.37          | 1.35       | 4.18                        |                             |

| TABLE 3.   |                        |   |                                    |                    |                        |              |               |            |                             |                             |
|--|------------------------|---|------------------------------------|--------------------|------------------------|--------------|---------------|------------|-----------------------------|-----------------------------|
| Final Model Logistic Regression Results for Significant Independent Variables with Having Suicide Plan as the Dependent Variable for Acute and Chronic Pain Patients |                        |   |                                    |                    |                        |              |               |            |                             |                             |
| Step   | $\chi^2$ (df), p value | % of Cases Predicted Correctly by the Model | Step Nagelkerke R <sup>2</sup>     | Variable           | Associated BHI-2 Scale | B            | Wald, p value | Odds Ratio | Lower 95% CI for Odds Ratio | Upper 95% CI for Odds Ratio |
| ACUTE PAIN PATIENTS  |                        |   |                                    |                    |                        |              |               |            |                             |                             |
| 50.6 (1), <0.001   | 89.3                   | .307  | Hostility Scale                    | Not applicable     | 0.12                   | 20.4, <0.001 | 1.13          | 1.07       | 1.19                        |                             |
| 17.9 (1), <0.001   | 91.0                   | .097  | Shortness of breath                | Somatic Complaints | 1.69                   | 12.8, <0.001 | 5.41          | 2.14       | 13.64                       |                             |
| 10.1 (1), 0.001  | 92.0                   | .052  | Irrational health fears            | Anxiety            | 1.74                   | 10.0, 0.002  | 5.71          | 1.94       | 16.76                       |                             |
| 9.0 (1), 0.003   | 91.6                   | .044  | Remaining hopeful despite setbacks | Perseverance       | -1.49                  | 9.0, 0.003   | 0.23          | 0.09       | 0.60                        |                             |
| CHRONIC PAIN PATIENTS  |                        |   |                                    |                    |                        |              |               |            |                             |                             |
| 77.5 (1), <0.001   | 84.2                   | .337  | Hostility Scale                    | Not applicable     | 0.08                   | 11.7, 0.001  | 1.08          | 1.03       | 1.13                        |                             |
| 17.4 (1), <0.001   | 84.8                   | .065  | Somatic Complaints Scale           | Not applicable     | 0.04                   | 5.0, 0.025   | 1.04          | 1.01       | 1.08                        |                             |
| 10.0 (1), 0.002  | 86.6                   | .036  | Feeling betrayed by others         | Borderline         | 1.41                   | 12.7, <0.001 | 4.09          | 1.89       | 8.85                        |                             |
| 8.6 (1), 0.003   | 86.3                   | .030  | Loss of identity                   | Borderline         | 1.34                   | 8.6, 0.003   | 3.81          | 1.56       | 9.31                        |                             |