Psychology and Behavioral Sciences
2021; 10(5): 178-182
http://www.sciencepublishinggroup.com/j/pbs
doi: 10.11648/j.pbs.20211005.13
ISSN: 2328-7837 (Print); ISSN: 2328-7845 (Online)

Self-reported Fear, Psychological Inflexibility and Opioid Dose in Relation to Pain

Brandon Alton Scott*, Thomas Barnes Virden III, Krista Perdue

Clinical Psychology, Midwestern University, Glendale, USA

Email address:
Bscott98@midwestern.edu (B. A. Scott)

*Corresponding author

To cite this article:
Brandon Alton Scott, Thomas Barnes Virden III, Krista Perdue. Self-reported Fear, Psychological Inflexibility and Opioid Dose in Relation to Pain. P*sychology and Behavioral Sciences*. Vol. 10, No. 5, 2021, pp. 178-182. doi: 10.11648/j.pbs.20211005.13

Received: October 1, 2021; **Accepted**: October 20, 2021; **Published**: October 29, 2021

Abstract: Within the past two decades, research on the treatment of chronic pain with opioid medication has attempted to understand the complex relationship between psychological factors, subjective pain experience, and prescription opioid use. Specifically, fear and psychological inflexibility factors have been explored in relation to both pain sensation and opioid dose. The current study aims to explore and enhance the understandings of brief, subjective self-report measures of fear in relation to opioid dose, subjective fear, self-reported pain, and psychological inflexibility processes. This study examined whether (1) a quadratic relationship would exist between pain scores and opioid dose; (2) individuals with higher opioid dosages would have higher psychological inflexibility scores and subjective fear of pain scores; (3) subjective fear scores, in concert with psychological inflexibility pain measures, would be predictive of pain scores, and (4) subjective fear scores would positively correlate to psychological inflexibility pain measures. The final sample consisted of 202 respondents of an online survey for chronic pain. Survey measures included the Chronic Pain Grade questionnaire (CPG), the Psychological Inflexibility in Pain Scale (PIPS), Subjective Fear of Pain when in Low Pain (FlowP), and when in No Pain (FnoP). Opioid dosage for each participant was converted to the standardized Morphine Milligram Equivalent (MME). A significant quadratic relationship between the CPG and MME was found ($p=0.016$). MME scores were *ns* in relation to Subjective Fear of Pain scores or PIPS. FlowP and FnoP, however, did predict overall pain scores for participants ($p<0.001$). Overall pain scores also showed a positive moderate relationship with overall PIPS scores ($r(200)=0.673$, $p<0.001$). FlowP and PIPS together explained 45.7% of the variance of pain scores ($F(2,199) = 83.640$, $p=0.003$, $R=0.676$, $R^2=0.457$) with FnoP and PIPS explaining slightly less at 44.8% ($F(2,187)=76.002$, $p<0.001$, $R=0.670$, $R^2=0.448$). FlowP, however, showed slightly stronger correlations to overall PIPS scores ($r(200)=0.648$, $p<0.001$) when compared to FnoP ($r(188)=0.589$, $p<0.001$). These findings support previous research indicating a quadratic relationship between pain and opioid dose. Higher pain scores were correlated to higher scores on PIPS and subjective fear of pain questions. Of benefit, the subjective fear of pain questions showed some minor predictability when used as a two-question predictor of pain. Our results not only support previous research underlying the relationship between opioid dose and pain but expand on insight into the use of short-form, fear-related questions to predict psychometrics such as psychological inflexibility and pain sensation.

Keywords: Psychological Flexibility, Pain, Opioid Use, Subjective Fear

1. Introduction

With recent advances in the field of medicine, professionals have been able to more effectively treat physical trauma, medical complications, and physiological disorders than ever before. These advances have given specialists the clinical knowledge and tools to produce pharmaceutical treatments strong enough to efficaciously manage chronic pain. The prescription of opioid analgesics is a routine part of treatment in clinical practices and hospitals to help those who suffer from chronic pain. Ethically, professional fields must attend to the needs of the chronic pain population in providing treatment and relief of symptoms. However, the expectation to adequately address these needs has now resulted in an increase in opioid addiction, over-prescription, and overdose, otherwise known

as the "opioid crisis" [1]. The Centers for Disease Control and Prevention stated in 2015, the number of opioids prescribed was enough for every American citizen to receive around-the-clock dosing over the course of three weeks [2].

Though the opioid crisis has provided professionals with a substantial amount of knowledge about pain and opioids, there is still much to learn. Unfortunately, chronic pain research is an extremely underfunded area within the sciences [3]. Nonetheless, individuals invested in research of this area continually work to combat this epidemic while also still providing adequate treatment and relief to those in need. As the prescription of opioid medications has more recently been the go-to method for addressing intractable pain, research on pain management alternatives has escalated [4]. In the past decade, different clinical disciplines have begun to adapt and modify basic medical models of pain. According to Ballantyne, chronic pain symptoms typically occur outside of the hospital setting and are usually managed by the patient [5]. Although physicians are monitoring the overall care, there may be the inherent risk of some individuals abusing their prescribed opioids, leading to possible addiction. Higher opioid usage for chronic pain has even been shown to correlate with worse patient outcome [6]. However, it is important to highlight there are individuals who still require a certain amount of analgesic control beyond the use of psychological interventions to reduce pain [4]. Understanding the psychological factors associated with successful non-pharmacological chronic pain treatment in relation to those taking opioid medication may shed light on ways to prevent addiction, overdose, and death [7].

One non-pharmacological treatment for pain that has become more accepted in the last few decades is Acceptance and Commitment Therapy (ACT) for chronic pain [8, 9]. ACT for chronic pain utilizes, in part, a principle historically used in certain Buddhist traditions for thousands of years: the acceptance of suffering to surpass suffering [10]. While this explanation has a philosophical tone, it's meaning can be divided into two well-accepted dimensions of chronic pain: 1. Individuals with chronic pain often avoid what they fear will put them in pain, called *experiential avoidance,* which, by doing so, reinforces their isolation and limitations but can also heighten their physical sensation of pain despite the attempt to avoid pain, and 2. Individuals with chronic pain often fuse their identity with their pain, also called *cognitive fusion*, defining themselves by their pain either intentionally or unintentionally. ACT for chronic pain focuses on alleviating both cognitive fusion and experiential avoidance of pain, collectively known as *psychological flexibility*. Moreover, previous studies have shown higher ratings on psychological inflexibility to one's pain correlates to higher levels of the physical sensation of pain [11]. ACT can strongly influence one's ability to manage chronic pain. Research on treating chronic pain has shown the psychological struggles that one endures may not solely be about their in-the-moment pain but rather their fear of potential pain. This heightened sensation of pain that these individuals face may be connected to the overall fear one has for the pain as opposed to their thoughts and behaviors in regard to their pain. Studies exploring placebo and nocebo effects on pain have shown the expectation of pain in itself can heighten pain scores [12]. This subjective fear of pain is thus a predictor of overall pain level [13]. While both psychological inflexibility with pain and overall opioid dosages in regard to chronic pain scores have been widely studied, the current authors postulate further exploration and inclusion of short psychometric measures on subjective fear of pain can extend our current knowledge. This study aims to both support previous studies of a similar nature as well as expand on the interconnectedness among the sensation of pain, subjective fear of pain, psychological inflexibility to pain, and opioid dose in relation to opioid type. The authors hypothesized (1) there will be a quadratic relationship between opioid dose and pain, (2) individuals with higher opioid dosages will have higher psychological inflexibility scores and subjective fear of pain scores, (3) subjective fear scores in concert with PIPS scores will be predictive of pain scores, and (4) subjective fear scores will be positively correlated in a linear manner to psychological inflexibility measures.

2. Methods

2.1. Survey Creation and Distribution

The study was approved by the Institutional Review board of Midwestern University -Glendale, Arizona campus (AZ # 1427). A survey was distributed online via eight (8) Facebook groups for chronic pain. Individuals who participated in the survey were entered into a raffle for one of three $10 Amazon gift cards. There were 248 participants who responded to the online survey. Any individuals who did not answer all questions within either one of the PIPS scores were removed as psychological flexibility is a main component of this study. Any individuals who answered nonsensically such as stating higher average pain than their "worst pain" or higher lowest pain than their "worst pain" or "average pain," was removed for suspicion of random answering. As such, a total of 202 respondents remained.

2.2. Measures

2.2.1. Pain

The Chronic Pain Grade (CPG) questionnaire, which provides self-reported levels of pain, was used to measure subjective pain [14]. The questionnaire addressed each participant's pain at intervals of current pain, average pain over the past six months, and worst pain over past six months. Responses were obtained using a Likert scale ranging from 1 ("no pain") to 10 ("pain as bad as it could be").

2.2.2. Subjective Fear of Pain

Respondents answered two questions related to subjective fear of pain. The first item was how much they feared their pain when experiencing no pain (FnoP), and the second item was how much they feared their pain when in low pain

(FlowP). Both questions were rated on a scale of 1 ("never") to 7 ("always").

2.2.3. Psychological Inflexibility in Pain

The Psychological Inflexibility in Pain Scale (PIPS) is a 16-item questionnaire including six questions about the respondent's cognitive fusion with pain and 10 questions about the respondent's experiential avoidance behaviors towards pain. PIPS is often used to better understand the overall psychological inflexibility an individual has towards their pain [15, 16]. All questions in the PIPS use a Likert scale from 1 ("never true") to 7 ("always true").

2.2.4. Opioid Type and Dose

Respondents were asked to self-report the opioid type, frequency, and dose they were taking for chronic pain. Within the survey it was suggested participants have their medication bottle available for increasing the likelihood of accurate responding. Reported opioid dose was then converted to the standardized Morphine Milligram Equivalent (MME) for the purpose of a singular comparable opioid dose measure despite difference in opioid type.

2.3. Analysis

Exploratory analysis through correlations was used with Pearson's r for parametric measures and Spearman's rho for non-parametric measures. Multiple regressions were used to determine predictability of dependent variables from subjective fear measures. To account for the nonlinear nature of MME, a quadratic regression was utilized. Independent t tests with Cohen's d were utilized to compare gender differences as well as differences between use or non-use of individual opioids by type. All factors were confirmed for normality before parametric, measures-based analysis.

3. Results

Age demographic analysis indicated the 202 remaining respondents reported as age 25-34 (n=87; 43.1%), 18-24 (n=56; 27.7%), 35-44 (n=28; 13.9%), 55-64 (n=17; 8.4%), 45-54 (n=11; 5.4%) and 65+ (n = 3; 1.5%). The majority of respondents reported as female (n = 126; 62.4% female vs. n = 76; 37.6% male). Racial/ethnic identification was reported as majority White/Caucasian (n = 66; 32.7%) with American Indian (n=54; 26.7%), Black/African-American (n=25; 12.4%), Asian-American (n=23; 11.4%), Hispanic or Latinx (n=19; 9.4%) and Pacific Islander (n=15; 7.4%). The majority of respondents reported chronic pain between one to two years (n=107; 53.0%) with the remainder reporting less than one year but greater than six months (n=51; 25.2%) and more than two years (n=44; 21.8%). The majority of respondents did not respond to both frequency and dose of their opioid for pain (n=133; 65.8% vs. n=69; 34.2%). Reported location of pain is presented in Table 1. Of the respondents, 69 (34.2%) responded with both their frequency and dose while 133 (65.8%) did not.

Table 1. *Significant Bivariate Correlations Between Variables.*

Measure	CPG[1]	FlowP[1]	FnoP[2]	AoPTotal[1]	FTotal[1]
FlowP[1]	.479*	----	----	----	----
FnoP[2]	.367*	.640*	----	----	----
AoPTotal[1]	.625*	.641*	.610*	----	----
FTotal[1]	.623*	.528*	.429*	.693*	----
PIPS[1]	.673*	.648*	.589*	.961*	.866*

Note: Superscript 1 measures have n = 202; superscript 2 measures have n = 190. * = correlation sig. at p<0.05 level (2-tailed). ** = correlation sig. at p<0.01 level (2-tailed). *** = correlation sig. at p < 0.001 level (2tailed).

Significant gender differences were found for MME. Male participants reported higher MME than female participants, with a medium effect size (M=1.6317, SD=0.4388 vs. M=1.9813, SD=0.6616; t(200)= -2.635, p=0.010, d= -0.640). Results from the Avoidance of Pain Scale indicated female participants had higher scores than those of male participants (M=49.24, SD=10.051 vs. M=45.47, SD=11.558; t(200)=2.436, p=0.016, d=0.354). Higher PIPS scores for female participants than male participants were also found (M=79.97, SD=14.859 vs. M=74.92, SD=16.138; t(200)=2.264, p=0.025, d=0.329).

In an independent t-test, all major variables demonstrated *ns* when comparing whether an individual answered both frequency and dose of their opioid medication other than their cognitive fusion scores. Individuals who answered in enough detail for their MME to be calculated showed a significantly higher difference in cognitive fusion scores, but with a small effect size (M=31.50, SD=5.946 vs. M=29.56, SD=5.90; t(196)=2.190, p=0.030, d=0.328).

A multiple regression utilizing PIPS Total as a predicted outcome and subjective FlowP and the subjective FnoP as predictor variables yielded a significant solution, explaining 46.2% of the variance ($F(2,187)=80.371$, $p < 0.001$, $R=0.680$, $R^2=0.462$). Subjective FlowP and subjective FnoP also predicted overall pain scores for participants, explaining 22.6% of the variance ($F(2,187)=27.327$, $p < 0.001$, $R=0.476$, $R^2=0.226$).

FlowP also predicted overall pain scores in concert with cognitive fusion ($F(2, 199)=71.738$, $p < 0.001$, $R=0.647$, $R^2= 0.419$), and pain fear avoidance behaviors ($F(2,199)=66.729$, $p < 0.001$, $R=0.634$, $R^2=0.401$) but showed the highest predictability, explaining 45.7% of the variance of pain scores when paired with overall PIPS scores ($F(2,199)=83.640$, $p=0.003$, $R=0.676$, $R^2=0.457$).

FnoP also predicted overall pain scores when paired with cognitive fusion ($F(2,187)=61.654$, $p < 0.001$, $R=0.630$, $R^2=0.397$) and pain fear avoidance behaviors ($F(2,187)=57.837$, $p < 0.001$, $R=0.618$, $R^2=0.382$) but also showed the highest predictability, explaining 44.8% of variance, when taken in concert with PIPS as a predictive factor ($F(2,187)=76.002$, $p < 0.001$, $R=0.670$, $R^2=0.448$).

Overall pain scores showed a positive, moderate relationship with overall PIPS scores ($r(200)=0.673$, $p< 0.001$), pain fear avoidance scores ($r(200)=0.625$, $p<0.001$), and cognitive fusion scores ($r(200)=0.623$, $p<0.001$). Overall pain scores demonstrated a positive, low correlation to subjective FlowP scores ($r(200)=0.479$, $p<0.001$) and subjective

FnoP($r(188)=0.367$, $p< 0.001$). MME scores were *ns* in relation to subjective FlowP, subjective FnoP, overall PIPS, pain fear avoidance behavior, and cognitive fusion scores.

A quadratic regression using MME and MME^2 as predictors of pain score indicated significance but only explained 12% of the variance, showing a quadratic relationship between pain and MME ($F(2, 65)=4.429$, $p=0.016$, $R=0.346$, $R^2=0.120$).

Subjective FlowP showed slightly stronger correlations to overall PIPS scores ($r(200)=0.648$, $p<0.001$), pain fear avoidance scores ($r(200)=0.641$, $p<0.001$), and cognitive fusion scores ($r(200)=0.528$, $p<0.001$) when compared to subjective FnoP scores ($r(188)=0.589$, $p< 0.001$ $r(188)=0.610$, $p<0.001$, $r(188)=0.429$, $p< .001$). Participant age demonstrated a low, positive relationship to both timespan of chronic pain experienced ($rs(200)=0.393$, $p<0.001$) and a very low but significant relationship to overall pain score ($rs(200)=0.147$, $p=0.036$). The number of opioid types participants reported being on showed low negative relationships to overall pain scores ($rs(200)=0.211$, $p=0.003$), subjective FlowP scores ($rs(200)= -0165$, $p=0.019$), and PIPS total scores ($rs(200)= -0.155$, $p=0.028$). The number of different opioids participants reported taking had a low, positive relationship to overall MME scores ($rs(67) = 0.269$, $p = 0.025$).

4. Discussion

Our first hypothesis that a quadratic relationship would exist between opioid dose and pain was supported. Our second hypothesis that PIPS scores and subjective fear scores would correlate positively to MME scores was not supported. Our hypothesis that subjective fear scores would act as predictive to pain scores when combined with PIPS was supported but showed more viability for the subjective fear when in low pain compared to subjective fear when in no pain. Our hypotheses that both subjective fear scores would correlate to PIPS in a linear manner were supported.

While PIPS acted as a highly significant predictor of pain score, the two subjective fear of pain scores (FlowP and FnoP) had a highly significant but low-level predictability, explaining approximately 25% of the variance in pain levels. Of more interest is the fact the FlowP scores, when combined with PIPS or either of the PIPS subscales of cognitive fusion or experiential avoidance, had almost as strong of an overall regression model as PIPS to pain scores alone. These results are congruent with the current understanding of how fear of pain relates to pain [11-13] but may also indicate the importance of subjective fear of pain, especially in times when pain is low but not absent. Fear of pains relationship to the sensation of pain has been studied previously in nocebo (priming participants that pain would be worse) versus placebo (priming participants that pain would minimize) and showed the thought or expectation of pain is correlated to stronger sensations of pain [12, 17]. Though the nocebo, placebo studies do not necessarily indicate fear itself, but the expectation of pain, metanalysis of the effects of fear on pain has been well documented [13]. We also know the detrimental effects that can occur from unchecked fear of pain such as kinesiophobia, where the fear of pain is significant enough to restrict movement [18-19]. Both the expectation of pain findings and the direct fear of pain findings in research appear to support the results found in the current study.

FlowP itself demonstrated a strong, highly significant relationship to cognitive fusion, experiential avoidance, and overall PIPS scores. More specifically, experiential avoidance (the PIPS subscale related to fear) had an almost perfect, positive linear correlation with overall PIPS scores, which may further emphasize the importance of understanding fear in regard to chronic pain. In comparison, cognitive fusion, the other PIPS subscale, had a strong but not nearly perfect positive linear relationship with the overall PIPS scores.

Through exploratory analysis, another relationship was found that potentially contributes to perceptions engrained in individuals with chronic pain. There was a significant level of cognitive fusion of pain reported by those who fully disclosed their type, dose, and frequency of opioid compared to those who did not. Though the relationship was significant, the effect size was small. The relationship between severe emotional distress and cognitive fusion [20] however may prompt future research around this finding to further explore its value in pain treatment.

5. Conclusion

One major limitation of the current study is the reliability of survey respondents' responses. Despite instructions to utilize information directly obtained from prescription bottles, only a percentage of individuals responded with substantial information to calculate MME. Additionally, as the study was conducted via an online survey reliant on self-report accuracy, prescription types and dosages could not be verified. The lower number of participants who fully answered their MME information may help explain why some of the hypotheses relying on MME remained unsupported. The possibility of multiple survey submissions, despite safeguards to avoid such matters, was also a possible limitation of the study.

Future exploration would be best to utilize direct chronic pain patient interaction and medical chart review within clinical settings to minimize the limitations found within this study.

In summary, the results of the current study support previous research on the complex relationship between pain and psychological inflexibility factors as well as morphine equivalent dose and pain while also presenting a novel connection between short form questions regarding subjective fear of pain, especially when in low pain, and the sensation of pain.

Acknowledgements

The authors thank Katelyn Coddaire, MA, for her efforts in editing the manuscript and Dr. Martha Kent of the Carl T. Hayden VA Medical Center – Phoenix, Arizona, for her constant professional support.

References

[1] Vijay, A., Rhee, T. G., & Ross, J. S. (2019). US prescribing trends of fentanyl, opioids, and other pain medications in outpatient and emergency department visits from 2006 to 2015. *Preventive Medicine: An International Journal Devoted to Practice and Theory*, 123, 123–129. https://doi -org/10.1016/j.ypmed.2019.03.022

[2] Centers for Disease Control and Prevention. (2017, July 6). *Opioid prescribing*. Centers for Disease Control and Prevention. https://www.cdc.gov/vitalsigns/opioids/infographic.html.

[3] Nicol, A. L., Hurley, R. W., & Benzon, H. T. (2017). Alternatives to Opioids in the Pharmacologic Management of Chronic Pain Syndromes: A Narrative Review of Randomized, Controlled, and Blinded Clinical Trials. *Anesthesia and analgesia*, *125* (5), 1682–1703.

[4] Rosenblum, A., Marsch, L. A., Joseph, H., & Portenoy, R. K. (2008). Opioids and the treatment of chronic pain: controversies, current status, and future directions. *Experimental and clinical psychopharmacology*, *16* (5), 405–416. https://doi.org/10.1037/a0013628

[5] Ballantyne J. C. (2017). Opioids for the Treatment of Chronic Pain: Mistakes Made, Lessons Learned, and Future Directions. *Anesthesia and analgesia*, *125* (5), 1769–1778. https://doi.org/10.1213/ANE.0000000000002500

[6] Palermo, T. M., & Kerns, R. D. (2020). Psychology's role in addressing the dual crises of chronic pain and opioid-related harms: Introduction to the special issue. *American Psychologist, 75* (6), 741 747. https://doi-org.mwu.idm.oclc.org/10.1037/amp0000711

[7] Morasco, B. J., Yarborough, B. J., Smith, N. X., Dobscha, S. K., Deyo, R. A., Perrin, N. A., & Green, C. A. (2017). Higher prescription opioid dose is associated with worse patient-reported pain outcomes and more health care utilization. *The Journal of Pain, 18* (4), 437-445. https://doi-org /10.1016/j.jpain.2016.12.004

[8] Buhrman, M., Skoglund, A., Husell, J., Bergström, K., Gordh, T., Hursti, T., Bendelin, N., Furmark, T., & Andersson, G. (2013). Guided internet-delivered acceptance and commitment therapy for chronic pain patients: A randomized controlled trial. *Behavior Research and Therapy, 51* (6), 307-315. https://doi-org/10.1016/j. brat.2013.02.010

[9] Trompetter, H. R., Bohlmeijer, E. T., Veehof, M. M., & Schreurs, K. M. G. (2015). Internet-based guided self-help intervention for chronic pain based on Acceptance and Commitment Therapy: A randomized controlled trial. *Journal of Behavioral Medicine, 38* (1), 66-80. https://doi-org/10.1007/s10865-014-9579-0

[10] Hayes, S. C. (2002). Buddhism and acceptance and commitment therapy. *Cognitive and Behavioral Practice, 9* (1), 58–66. https://doi-org /10.1016/S1077-7229(02)80041-4

[11] Fish, R. A., Hogan, M. J., Morrison, T. G., Stewart, I., & McGuire, B. E. (2013). Willing and able: A closer look at Pain Willingness and Activity Engagement on the Chronic Pain Acceptance Questionnaire (CPAQ-8). *The Journal of Pain, 14* (3), 233–245. https://doi.org/10.1016/j.jpain.2012.11.004

[12] Elsenbruch, S., Roderigo, T., Enck, P., & Benson, S. (2019). Can a brief relaxation exercise modulate placebo or nocebo effects in a visceral pain model? *Frontiers in Psychiatry*, 10. https://doi-org.mwu.idm.oclc.org/10.3389/fpsyt.2019.00144

[13] Markfelder, T., & Pauli, P. (2020). Fear of pain and pain intensity: Meta-analysis and systematic review. *Psychological Bulletin, 146* (5), 411–450. https://doi.org.mwu.idm.oclc.org/10.1037/bul0000228

[14] Von Korff, M., Ormel, J., Keefe, F. J., & Dworkin, S. F. (1992). Chronic Pain Grade Questionnaire [Database record]. Retrieved from PsycTESTS. doi: https://dx.doi.org/10.1037/t10391-000

[15] Wicksell, R. K., Renöfält, J., Olsson, G. L., Bond, F. W., & Melin, L. (2008). Psychological Inflexibility in Pain Scale. PsycTESTS. https://doi.org/10.1037/t23288-000

[16] Wicksell, R. K., Renöfält, J., Olsson, G. L., Bond, F. W., & Melin, L. (2008). Avoidance and cognitive fusion-Central components in pain related disability? Development and preliminary validation of the Psychological Inflexibility in Pain Scale (PIPS). *European Journal of Pain, 12* (4), 491–500.

[17] Roderigo T, Benson S, Schöls M, Hetkamp M, Schedlowski M, Enck P, et al. (2017) Effects of acute psychological stress on placebo and nocebo responses in a clinically relevant model of visceroception. *Pain. 158*: 1489–98. doi: 10.1097/j.pain.0000000000000940g/10.1016/j.ejpain.2007.08.003

[18] Asiri, F., Reddy, R. S., Tedla, J. S., ALMohiza, M. A., Alshahrani, M. S., Govindappa, S. C., & Sangadala, D. R. (2021). Kinesiophobia and its correlations with pain, proprioception, and functional performance among individuals with chronic neck pain. *PLoS ONE, 16* (7). https://doi.org/10.1371/journal.pone.0254262

[19] Varallo, G., Scarpina, F., Giusti, E. M., Cattivelli, R., Guerrini Usubini, A., Capodaglio, P., & Castelnuovo, G. (2021). Does Kinesiophobia Mediate the Relationship between Pain Intensity and Disability in Individuals with Chronic Low-Back Pain and Obesity? *Brain Sciences, 11* (6). https://doi.org/10.3390/brainsci11060684

[20] McCracken, L. M., Patel, S., & Scott, W. (2018). The role of psychological flexibility in relation to suicidal thinking in chronic pain. *European Journal of Pain, 22* (10), 1774–1781. https://doi.org/10.1002/ejp.1273