Treating Anxiety-Based Cognitive Distortions Pertaining to Somatic Perception for Better Chronic Pain Outcomes

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Abstract: Anxiety-based cognitive distortions pertaining to somatic perception (ABCD-SP) - primarily catastrophizing, fear avoidance and kinesiophobia- have been repeatedly linked to worsening chronic, non-cancer pain (CNCP) outcomes of increased disability, amplified pain, ineffective opioid use, and opioid misuse. Several studies have suggested that treating ABCD-SP can improve pain outcomes. Utilizing a narrative review of proposed mechanisms, published patient perspectives, and study correlates connecting these cognitive distortions with CNCP outcomes, a better practice approach to the delivery of standard clinical CNCP care can be deduced. These recommendations require relatively few resources to implement and have the potential to lead to more effective CNCP treatment on a large scale.

Keywords: Chronic Pain; Catastrophizing; Fear Avoidance; Kinesiophobia; Opioids; Anxiety; Depression

1. Introduction

Chronic, non-cancer pain (CNCP) is estimated to affect more than 100 million adults in the United States and generally satisfactory remedies continue to be elusive [1,2]. Within the pain management field, recent treatment standards have resulted in secondary problems for the individual patient and in the greater public health arena, such as: ostracizing patient stigma [3,4], morbidity and mortality from adverse medication effects [5], the rise and reign of the opioid epidemic [6], and skyrocketed costs of managed care [4]. The financial burden of morbidity related to CNCP is more than that of the afflictions of heart disease and cancer combined, and has been tallied to be over 600 billion dollars per year in the United States.[2] Identifying more effective and efficient care approaches for those who suffer with CNCP continues to be a priority need in US healthcare.

Pain catastrophizing is the most common cognitive distortion seen in patients with chronic pain, and severe catastrophizing is prevalent for nearly 40% of people experiencing CNCP.[7,8] This belief paradigm has been linked to maladaptive behavior and resulting negative CNCP sequelae[9] exemplified by increased disability, [13–15] pain intensity, [17,18] emotional distress,[10] absenteeism, [14] and ineffective opioid use [17,19]. Cognitive distortions are defined as faulty or inaccurate thinking, perceptions, or beliefs [9]. Catastrophizing is characterized by the belief that the worst possible outcome will occur when in a setting that may be serious and upsetting, but is not necessarily disastrous [9]. Pain catastrophizing is associated with feelings of helplessness to succumb to a catastrophic outcome, as well as hypervigilance to behave in a way that avoids stimulus that may insight discomfort in painful areas [20]. The pervasiveness of this symptomatology withing the chronic pain experience, in both frequency and influence, warrant attention when looking to improve the quality of CNCP treatment.

Ineffective opioid use and misuse are pervasive problem that contribute to poor patient outcomes and to larger public health concerns regarding the opioid epidemic [4,5,17]. The negative

sequelae of full mu agonist long term opioid therapy (LTOT) are numerous and well documented, and are amplified when patients fail to experience reasonable functional and analgesic satisfaction from such therapy. Adverse effects range from immediate [22] (cognitive impairment, misuse and abuse liability, potentially fatal respiratory depression and – in the case of methadone- cardiac arrhythmias [23]) to long term and insidious (hypogonadism [24], immune compromise [25], and hyperalgesia [26,27]). The chronicity incurred from LTOT use is burdensome not only to the individual, but to society as a whole, in the form of increased managed care charges [4], longer lengths of disability [6] and a nationally depressed life expectancy due to rising fatal opioid-related overdoses [6,28,29].

Due to abundant evidence of the synergy between pain-related catastrophizing and worsening negative sequelae of CNCP, care planning to assess and address this cognitive distortion should be a foundational part of the CNCP treatment. Utilizing a narrative review of proposed mechanisms, published patient perspectives, and study correlates connecting this cognitive distortion with disability, pain levels, and/or ineffective opioid use or misuse, a better practice approach for pain clinicians can be deduced, rooted in holistic clinical assessment, abundant patient education, supportive fear quiescence, and therapeutic confrontation of concerns. This new approach requires few resources to implement and has the potential to lead to a more effective CNCP treatment on a large scale.

2. Anxiety-Based Cognitive Distortions Pertaining to Somatic Perception (ABCD-SP)

More than one assessment scale has been validated in an attempt to quantify the clinical significance of the contribution of pain-related catastrophizing to the morbidity of CNCP. Most literature examines the relationship between CNCP sequelae as related to this cognitive distortion via one of the following: The Fear Avoidance Beliefs Questionnaire (FAB), The Pain Catastrophizing Scale (PCS) and the Tampa Scale of Kinesiophobia (TSK) (Table 1). Due to the plurality of these validated tools, this paper has adopted an encompassing term to discuss the significance of their contribution to the morbidity of CNCP: Anxiety-Based Cognitive Distortions Pertaining to Somatic Perception (ABCD-SP).

Table 1. Table of Assessments for Anxiety-Based Cognitive Distortions Pertaining to Somatic Perception (ABCD-SP).

Fear Avoidance Beliefs Questionnaire—Work and Physical Activity (FAB-W and PA)[11,17,31]	Two subscales (FAB-W: 0-42; FAB-PA 0-24) in which higher scores indicate more severe pain and disability due to fear avoidance beliefs about work and physical activity, respectively. Various score thresholds have been documented as associated with clinical relevancy and specific negative chronicity of CNCP. Higher scores have been associated with poor physical and manual therapy results and low return to work rates after an injury.
Tampa Scale of Kinesiophobia (TKS)[32,33]	A measure of fear of movement and reinjury. Scores range from 17–68, with higher scores being of higher severity. Higher TKS scores have been correlated with higher disability and pain scores.
Pain Catastrophizing Scale (PCS)[19,34,35]	Assesses levels of catastrophizing. In initial validation, a score of 30 or more correlated with high unemployment, self-declared "total" disability, and clinical depression. However, various lower score thresholds have been documented as associated with clinical relevancy for specific negative chronicity of CNCP.

2.1. An Overview of The Role of ABCD-SP in the Negative Sequelae of CNCP

ABCD-SP in the setting of CNCP have been repeatedly linked to worsening pain outcomes. Such beliefs, and resulting maladaptive behaviors, have been associated with increased disability, [13–15] pain intensity, [17,18] emotional distress, [10] and absenteeism [14]. Studies have shown that fear of

movement and reinjury is a better predictor of self-reported disability and treatment failure than biomedical findings or pain intensity levels [36–38]. ABCD-SP have also been documented to affect opioid use in terms of prolonging postoperative use, increasing opioid craving, and contributing to general misuse [17,39,40].

Objectively, improvement in ABCD-SP can be visualized on functional MRI, and improvements correlate with a decreased pain state.[43,44] Catastrophizing has been shown to recruit regions of the brain that evoke a more intense suffering response to mild pain, and an inability to decouple and suppress more intense pain when compared to controls [43]. A successful decrease of catastrophizing via cognitive behavioral therapy (CBT) has been shown on functional MRI to increase grey matter mass, an anatomical substance known to generally be reduced in volume and density in patients who suffer with chronic pain [44].

Perhaps most persuasive regarding the import of ABCD-SP to CNCP-related morbidity are the studies that suggest treating ABCD-SP can reverse some of the negative sequelae associated with CNCP. It has been documented that treatment campaigns targeting ABCD-SP can have a positive effect on the clinical outcomes of somatic symptom prevalence and the length of pain episodes when effectively reduced [31,45,46]. Some studies have shown efficacy harnessing ABCD-SP education to affect positive change in disability length related to CNCP [45,48].

2.2. ABCD-SP Validated Assessment Tools

2.2. a. The Fear Avoidance Beliefs Questionnaire (FAB)

The Fear Avoidance Beliefs Questionnaire (FAB) was designed to measure fear-avoidance beliefs about physical activity and work, and it has strongly correlated these beliefs with work loss and pain [11]. The FAB consists of two subscales: Work (FAB-W) and Physical Activity (FAB-PA). Several studies have investigated the reliability of the FAB for the assessment of fear avoidance among patients with various etiologies of CNCP [31,36,49]. A higher FAB score has consistently been shown to correlate with an increased probability of current and future work loss and disability [11,14,15] as well as social withdrawal.[16]   While the relationship between an elevated FAB score and increased disability and pain remain correlated, the optimal cut off for determining a significant FAB score in relation to negative chronicity in CNCP varies according to the pain context [49,51,52]. Higher FAB scores have also been shown to significantly predict treatment failure [49,50]. FAB analysis has also been used to determine which clinical interventions have a better likelihood of a successful outcome to decrease patient-reported disability and pain [49–51]. An elevated FAB-PA has been shown to be a strong correlate with the inability to cease ineffective LTOT use, more so than morphine equivalent levels and elevated Current Opioid Misuse Measures (COMM) scores [17].

Several studies have examined the relationship between improved disability and treatment of CNCP via graded exposures that confront fear avoidant beliefs and behaviors to improve patient self-efficacy and overall disability [57–59]. FAB targeted educational campaigns have had positive effects on beliefs and clinical outcomes [31,45,46]. Specifically, one study found that successfully lowering fear avoidance scores in patients with chronic back pain, through an educational campaign, resulted in subsequently decreased patient reports of disability [45].

2.2. b. The Pain Catastrophizing Scale (PCS)

The PCS determines a patient's level of pain catastrophizing, which is tested by assessing the elements of rumination, magnification, and helplessness [35]. It was created to better assess the relationship between greater pain intensity, negative pain-related thoughts, and greater emotional distress. Higher scores have been shown to significantly correlate with a prediction of pain intensity and emotional distress, [35,39,41] and have also been implicated as a risk factor for increased disability length, [48,54,58] pain interference, [62] and delayed return to work [34]. Preoperative catastrophizing can even predict higher postoperative pain levels and poorer patient-reported postoperative satisfaction following minimally invasive implantations [63] and surgery [64–66]. It

has been postulated that this correlation may contribute to increased use of health care services and higher costs to the health care system [68].

Targeted therapy to improve catastrophizing has been shown to significantly improve pain outcomes. Pain intensity and disability have been shown to improve with improved PCS scores when maladaptive beliefs were challenged via education and cognitive restructuring, even when such interventions occurred on a purely theoretical and cognitive level [54]. Combined physical therapy (PT) with treatment to minimize psychological catastrophizing barriers improves return to work rates [48,58]. One study reported this treatment combination had a 25% higher return to work rate than physical therapy alone [48]. PCS score improvements have also been correlated with successful cessation of ineffective LTOT in a population for whom cessation had not been previously achievable through usual care methods [18].

2.2. c. The Tampa Scale of Kinesiophobia (TSK)

The TSK is a measure of fear of movement, injury or reinjury [32] and has been validated for use in assessing comorbidities of chronic pain from multiple etiologies, including backpain, neck pain, lower limb complaints [69,70], and fibromyalgia [12,32,71]. Increased TSK scores are implicated in decreased physical performance and increased pain intensity, depressive symptoms, pain-related anxiety, and disability [12,72]. Like the PCS and FAB, the TKS has also been associated with ineffective opioid use and misuse. [17–19] Several studies have shown that high kinesiophobia is an independent risk factor for less satisfactory treatment outcomes [69,70,73]. Also, similar to the other ABCD-SP assessments, studies show that targeted cognitive exercises for decreasing kinesiophobia can improve disability [73] and pain [74] when combined with PT better than PT alone, [75–77] and can improve pain intensity and physical function [78–80].

3. Pathology of Anxiety-Based Cognitive Distortions Pertaining to Somatic Perception – Proposed Mechanisms

The Fear Avoidance Belief and Behavior Model (Figure 1) [11,17,49] can be visually represented to illustrate the different trajectories for patients with a low fear reaction, versus patients with a catastrophizing reaction to their pain experience. The basic tenet of the model is that the way in which pain is interpreted leads to two potential pathways. When pain is perceived as no, or low, threat, patients are likely to behave in a way that confronts real, or perceived, factors that limit their pursuit of meaningful endeavors. This step of confrontation is imperative to eventually overcome those limitations and move toward recovery. In the case of opioid use, the low fear pathway leads to only use a short course of opioids before decreasing use, or ceasing use altogether, thus minimizing or eliminating adverse medication effects [17].
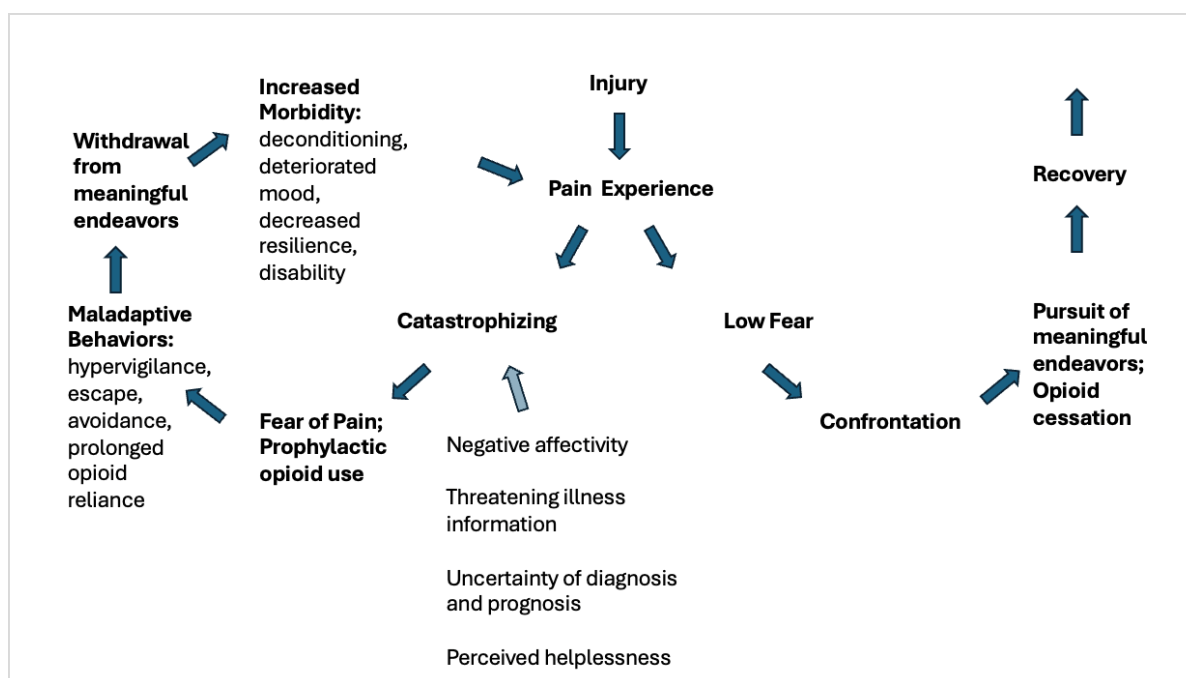
Figure 1. The Fear Avoidance Belief and Behavior Model [11,17,49].

In contrast, a maladaptive cycle may be initiated when pain is perceived through a catastrophizing lens. Catastrophizing entails, among other things, a sense of overwhelm and powerlessness to succumb to external, negative forces and experiences [9,54] This gives rise to pain-related fear, activity avoidance, experience escape (including prolonged opioid use, or misuse) and a negativity-biased hypervigilance. These propensities lead to a progressive withdrawal from meaningful activities and an eventual decline in the physical and emotional capability to access resiliency-building experiences and tools, as previously identified activities of meaning become unattainable. While avoiding the stimuli suspected, or proven, to provoke pain can be adaptive in the acute pain stage, it paradoxically entrenches disability and reliance upon opioids in the subacute and chronic stages of pain. Eventually, the long-term consequences of deconditioning due to disuse [81] and mood deterioration, [21,39,82] result in increased morbidity [6,29] and decreased ability to recruit and access alternative, resilience-building, non-opioid chronic pain coping mechanisms [17].

Several things can accelerate and amplify the maladaptive cycle. Receiving threatening information about a diagnosis can understandably send a patient's focus to worst-case scenario possibilities. However, uncertainty about a diagnosis can be just as disturbing as threatening information [11,85]. Lack of understanding about the significance of pain is one of the main reasons for patients with CNCP to appear to the Emergency Department (ED) for care [86]. Negative affectivity and mood disorders, especially anxiety and depression, [87,88] coexisting in the patient also promote and propel the catastrophizing cycle via a distortion of negativity bias [85]. Also, a history of trauma – even if it precedes the inciting pain event- can propel this maladaptive cycle. A large body of evidence shows that numerous morbidities are accelerated, if not generated, by exposures to adverse childhood experiences (ACEs) [89] which foster general hypervigilance and negativity bias in daily experiences, resulting in increased catastrophizing and pain-related suffering, among multiple other poorer health outcomes [90].

Fear avoidance of movement due to pain, from the stance of learning theory, is a self-perpetuating dynamic in which a small sensory insult – or even the threat of such an insult- can propel anticipation of hyperbolized potential consequences and create -and reinforce- global, habitual and maladaptive behavior [91]. These anticipations of pain hinder trials of adaptive activity. When the expectation of catastrophic pain is not confronted, it cannot be disproved, leading to further maladaptive beliefs and behaviors, deconditioning, and disability [11,17,92]. As Vlaeyen et al. state in their paper describing the Fear Avoidance Model, "Avoidance can be used as a source of

information to derive danger, for example: *"I am avoiding, therefore there must be danger."* The relief that the expected threat did not occur may reinforce avoidance behavior, and hence maintain it." [85].

This uninterrupted cyclic dynamic is also applicable in the context of problematic LTOT usage, as many patients associate the action of taking a scheduled opioid with that of prophylactically avoiding or escaping pain, and thus rarely confront the unadulterated experience of their physical nociception, spiraling deeper into habitual opioid administration and the resulting adverse effects of LTOT use. This dynamic is compounded in opioid use, as it is triply reinforced by dopaminergic incentivization and abrupt abstinence syndrome disincentivization [17].

4. The Call for a Belief and Behavior Action Plan (BBAP)– Theoretical Considerations

Using a reverse-engineering approach to the Fear Avoidance Belief and Behavior Model, entry points for promoting a more healthful ABCD-SP dynamic in the pursuit of better CNCP outcomes emerge for the pain clinician (Figure 2). The maladaptive cycle is amplified and accelerated when the patient perceives threatening illness information, uncertainty of diagnosis and prognosis, and the perception of powerlessness to succumb to an overwhelming amount of negative sequela. Thus, initial and on-going quality communication between a clinician and patient about pain etiology, treatment, and prognosis is substantive to the patient's pain experience and treatment outcome potential. Much as the technique of Motivational Interviewing has been a highly effective and relatively easy treatment technique to disseminate to improve significant measures in multiple chronic physical and psychological diseases [94], there is an opening for a simple - yet sophisticated - change in clinicians' approach to communication about the pathology of CNCP with patients. Specifically needed is a patient-centered, individualized approach to treatment planning that develops empowered agency and supports therapeutic ABCD-SP identification and confrontation within the scope of patient-identified activities and endeavors of meaning. This treatment approach should address patient-disclosed fears, concerns, and misconceptions in a supportive, open-ended, and ongoing manner, and should culminate in the clinical facilitation of a patient-generated *Belief and Behavior Action Plan* (BBAP) for CNCP

To begin to formulate what a BBAP for CNCP would entail, we must first look beyond data and diagrams to the patient perspective. Numerous reports have documented patients' dislike, and frank objection, to medical discussions involving "catastrophizing" and like terms. Many patients have called the concept of categorizing their pain experience in this way – as a maladaptive psychological response and behavior - as condescending, and even disenfranchising [95]. Some feel that validated terms used within the medical community to assess and address ABCD-SP carry connotations of "pain shame" [96]. Patients have reported that the label of "catastrophizer" is perceived as unempathetic, stigmatizing, blaming, judgmental, dismissive, minimizing and weaponizable as a tool to selectively restrict treatment [95]. Some have even contended that the term "catastrophizing" can harbor systemic racism and microaggression, especially when a care plan has failed to distinguish between an ABCD-SP and a generalized stress response to the overall institution of medicine, which for some is a construct fraught with inaccessibility [97], injustice, inequality and discrimination. [98,99]. One group of scholars has set about renaming the phenomena of catastrophizing altogether [100]. Despite the mounting volume of these valid and important voices, many feel resigned that medical stigma will eventually undermine any nomenclature revision attempt to create a patient-centered term used to describe the ABCD-SP that are a prominent feature in the CNCP experience [101].

Semantically, the notion of categorizing the ABCD-SP experienced by so many with CNCP as an added pathology is arguably redundant, if not excessively persecutory– a point that has also been made by patients and advocacy groups [95,96]. Pain is defined as, "An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage." [102] Literally, the *emotional experience* associated with *potential* tissue damage is *real* pain, and consequently, treating the ABCD-SP should be conceived of as providing holistic pain care. Thus, ABCD-SP should be evaluated for and addressed, like other associated pain symptoms and features-such as radicular symptoms or paresthesia- in every case of CNCP. Each of these features should be

associated with the appropriate treatment line item in a comprehensive care plan, just as a different medication class might be used for neuropathic versus axial pain.

The above discussion begins to illuminate the need for a paradigm shift in the conceptual construct of not only the patient, but also the medical provider. First and foremost, patients need to be approached with empathy. While this may seem self-evident, empathy is not a universal patient experience for patients with CNCP, who have likely experienced diagnosis-associated discrimination and marginalization from the general and medical communities [103]. Aside from maintaining the integrity of the Hippocratic oath, empathy and trust are imperative to bring about fertile ground for true cognitive, physical & prognostic change for patients with CNCP [104]. In a cohort study that included 1470 adults with chronic low back pain, physician empathy was more strongly associated with favorable outcomes pertaining to pain, function and quality of life than were nonpharmacological treatments, opioid therapy, and lumbar spine surgery [105]. This approach bears particular portent in the contemporary environment where many patients have become "opioid refugees" [106–108]. This dynamic is compounded for populations experiencing generalized discrimination due to racial, ethnic, gender or sexual backgrounds or identities that differ from that of their clinician [109–111].

5. Creating a Belief and Behavior Action Plan (BBAP) - Clinical Considerations

Creating a comprehensive and empathetic BBAP for CNCP begins with thorough information gathering on the part of the clinician. An effective pain evaluation and assessment must go far beyond the "OPQRST" (Onset, Palliation/Provocation, Quality, Radiation, Severity, Timing) that is taught in training. It should include a comprehensive mood assessment as well as a healthcare literacy reconciliation between what the patient has been told and what the patient understands -and believes- about their diagnosis and prognosis. Also included should be a cataloging & recording of the patient's pain-related concerns; a recollection of the patient's similar past experiences; adequate time to discuss expectations about potentially affected patient-identified meaningful activities. A thorough clinician will also be cognizant of a potential history of actual or perceived disenfranchisement, discrimination, or implicit bias on the part of the medical system toward the patient [111,112]. It has been postulated that inquiring about this last experience openly and early may help avoid repeat offenses on the part of unintending clinicians, and facilitate a more equitable and effective therapeutic relationship [98]. Any and all of the factors above – and potentially more – can be nidi for anxiety that can ignite and fuel the fear avoidance belief and behavior cycle [13,85,98] and each symptom – and associated belief and behavior- should be documented, triaged, and revisited every visit as part of the symptomatology requiring palliative and restorative CNCP care planning.

The goal of the BBAP for CNCP should be to end with a patient-empowering care plan strongly rooted in patient self-efficacy. The patient and clinician should work together to create a menu of patient treatment options, independent of the part of the care plan that relies upon a medical, rehabilitative, or behavioral health clinician. To assign the appropriate patient-administered actions to the BBAP, the patient's descriptions of symptoms should be cataloged in terms of levels of severity and physical and emotional distress, along with an associated detailing of the default patient behavioral reaction to these symptoms. These scenarios should then be examined individually and optimized when effective, and gently challenged and replaced when they have been ineffective in the past. The end result is that the patient should leave every clinical visit with an approachable and navigable treatment action plan documenting several ways in which they have control and agency to access pressure release valves for the full spectrum of pain flare severity that may occur. These BBAP interventions should include features that are accessible when in and out of the home, and which represent treatment modalities from a variety of dimensions, including: behavioral, physical, social, medical, spiritual, occupational.

Clinical efficiency and the demands of billable time have been cited as a barriers to more encompassing CNCP care planning [113]. Cultivating a BBAP that fosters patient empowerment and autonomy, and adequately addresses patient-specific healthcare literacy and individualized

concerns, requires time and resources that clinicians are often disincentivized to employ during their limited billable minutes. However, this nearly ubiquitous impediment of limited clinical facetime stems from an unbalanced cost-benefit equation, especially during the initial visit. It is problematic on several fronts that providing a minimally invasive surgery or procedure may take as much time - and reimburse exponentially better - than a thorough face to face conversation with a patient seeking palliation for a pain complaint, and that a clinician can complete several billable prescription refill visits in the time it takes to thoroughly communicate with one patient. The counterproductivity of this dynamic is illustrated further by research that suggests that patients will be less satisfied with the outcomes of these same interventions [63], surgeries [64–66], and medications [17] if their ABCD-SP aren't adequately addressed first. Thus, attempts to conserve clinical resources by delaying holistic pain care rooted in emotional resiliency building, stress reduction, health education and facilitated human connection has often resulted in higher overall managed care costs regarding patients with CNCP [4].

6. Creating a Belief and Behavior Action Plan (BBAP)- Recommendations and Practical Considerations

Regardless of the confines of medical system reimbursement structures, clinical and practical considerations can be combined to implement many, if not all, of the following derived, better-practice recommendations to create a BBAP for CNCP (Figure 2.):
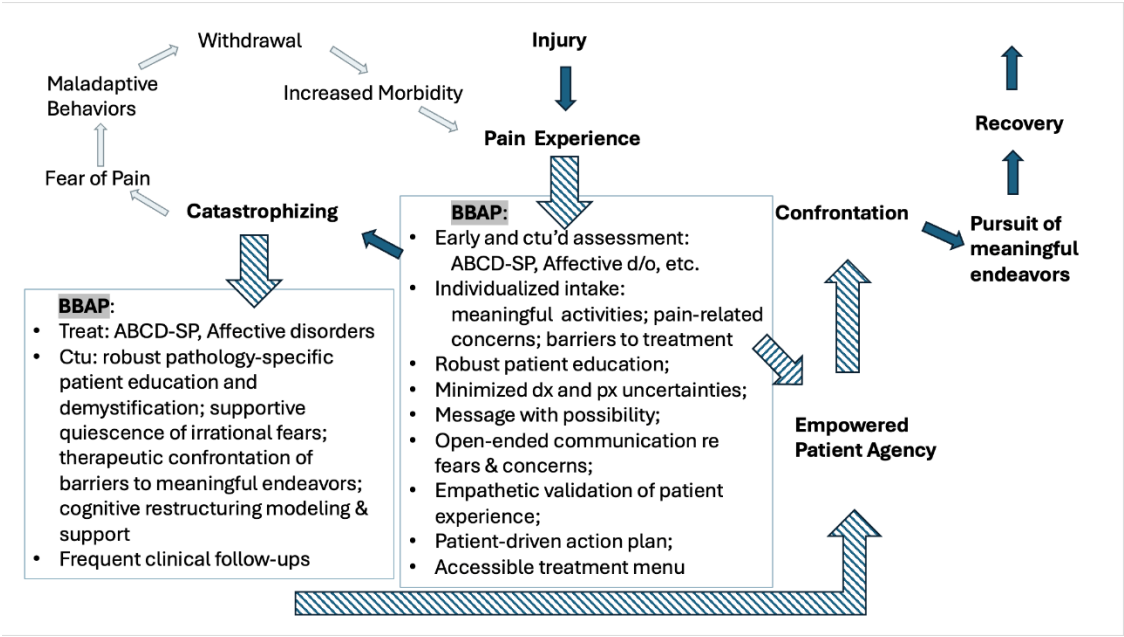
Figure 2. Belief and Behavior Action Plan (BBAP) for CNCP: The better-practice treatment approach is recommended to be inserted by clinicians at specifically identified care plan intervals - indicated by striped arrows- in order to shunt treatment outcomes toward more adaptive outcomes. Abbreviations: ctu/ctu'd= continue/continued; d/o = disorders; dx= diagnostic; px = prognostic.

I. Utilize standardized assessments and short answer questionnaires upon initial evaluation, and periodically and follow up, to assess and monitor ABCD-SP rehabilitative interference potential:

  a. Standardized assessments:

    i. Assess for high ABCD-SP via one of the frequently used, validated assessments of the FAB, PCS or TSK [35,50,85].

    ii. Assess for mood disorders that can be independent risk factors for ABCD-SP escalations, especially depression and anxiety [17,19,87].

    iii. Offer a validated instrument assessing perceived discrimination [98,114].

b.   Short answer questionnaires to catalogue patients' perceptions regarding:

   i.   Concerns and fears related to their pain or treatment [50,85].

  ii.   Perceived barriers to accessing helpful pain treatment [97,115].

 iii.   Activities of meaning to lay the groundwork to create an individualized care plan to:

   1.   strategize support and diminish negative impact on these activities.

   2.   better motivate patient participation [19].

   3.   apply to cognitive restructuring exercises [50,85].

   4.   aid in decreasing treatment plans rooted in implicit bias for populations heralding from a race, culture, gender, sexuality, generation that differs from the provider [116].

 iv.   Satisfaction with their current and previous pain treatment: which interventions, medications, therapies, etc. have been perceived as the most helpful, and which were the most problematic [17,19].

II.   Implement an intentional BBAP inquiry and communication strategy and style in the clinical visit:

a.   Invest heavily in the first visit by performing a deep exploration and inquiry into the patient's pain experience and their current related beliefs and resulting behaviors [94].

b.   Demonstrate empathy [105,117].

c.   Use validating active listening, which has been shown to increase patient adherence to care planning [118].

d.   Lean into, and address head-on, patient's accounts of suffering and fear in the clinical setting, so as to:

   i.   dispel the ability of these sentiments to hijack adaptive recovery processes when the patient ruminates alone [86].

  ii.   decrease the suffering of invisibility that patients with CNCP often face. While it's difficult for clinicians to focus on a patients' suffering because of the accompanying sense of clinical impotence, and frequent lack of objective solutions, simply witnessing the patient's subjective suffering experience may decrease suffering in itself [119].

e.   Be cognizant of both the implicit and explicit messages inherent in communications imparted by the clinician to the patient about diagnosis and prognosis. Positive self-perceptions and health-related optimism correlate with improve pain suffering, pain-related disability [85,88,90] and even improved longevity [123]. When possible and appropriate, choose vocabulary and descriptors that de-escalate the patient's perceived threat of nociceptive input, and highlight functional and meaningful possibility.

f.   Message with mindfulness of potential trauma-affected hyper arousal and increased sensitivity to pain [124].

g.   Temper areas of diagnostic uncertainty and remaining investigation with clear descriptions of investigative next steps, while explicitly outlining the activities that are safe to pursue in the interim [50,85].

h.   Increase healthcare literacy and promote pathological understanding:

   i.   Ask patients to paraphrase their understanding of their injury, pain and pathology. Note terminology used and connect medical terminology to patient's perceptions and descriptions to promote demystification [50,85]. Correct misconceptions and maintain patient-generated frame of reference and terminology, when appropriate.

ii.   Consider inviting a call and paraphrased repeat opportunity between the clinician and the patient to improve comprehension of pathology and related care plan.

iii.   Assuming the standard use of language interpreters to bridge translation barriers, also employ visual aids and physical models to engage multiple patient learning style preferences to explain not only pathology, but the mechanisms of pain symptomatology in an effort to decrease anxiety related to somatic presentations.

i.   Orient to when fear of catastrophe is warranted.

i.   Debrief previous urgent, or emergent, clinical visits to seek pain treatment. Discuss causational factors and care plan for future episodes in the form of improved medication organization, strategized BBAP interventions, change of medication regimen for more effective analgesia, change of formulary or treatment type for improved access, etc.

ii.   Orient to "red flag" signs and symptoms that medically warrant emergent attention and educate to differentiate from chronic, stable stimuli.

III.   BBAP components should include:

a.   Cultivation of an empowering, patient-driven action plan to complement the larger treatment plan containing the following elements:

i.   Facilitation of a menu of active, self-care options to address various pain levels and flares. Includes features accessible in and out of the home, and which represent treatment modalities from a variety of psychosocial domains: behavioral, physical, social, medical, spiritual, occupational, etc.

ii.   Minimized barriers- and the "gate keeper" nature- of clinical treatment options where possible, and within the confines of evidence-based care, which inherently promote a role of helplessness, perceptions of scarcity, and an external locus of control.

1.   prescribe medications and self-administered devices that can be safely used prn for specific indications [17,19].

2.   Orient to a home exercise program for multiple psychosocial domains that can diminish pain [54].

3.   Care plan creatively around potential socioeconomic barriers of access (transportation, mobility, coverage, cost, etc.) by choosing generic, refilling less often, providing telemedicine, etc. [125].

b.   A patient-controlled mechanism to maintain a continuous log of worries and fears associated with pain symptomatology, for use in the CBT-based exercise of Cognitive Restructuring,[126] which has been shown to be helpful for CNCP outcomes even when self-administered [127,128].

c.   Frequent routine clinical follow ups to consistently support the ABCD-SP cognitive restructuring process in the model of treatment recommended for Somatoform Disorders [129,130], as catastrophizing and Somatoform Disorders share many clinical features and frequently co-exist [131].

7. Discussion & Limitations

The recommendation for the pain clinician to create a BBAP doesn't discount the significant role that psychologists and other allied professionals contribute to the myriad facets of CNCP treatment via an interdisciplinary care plan. In fact, most studies have shown greatest success addressing ABCD-SP via multimodal efforts, especially when including physical therapies, CBT, and/or Acceptance and Commitment Therapy [132]. However, CNCP is frequently and synergistically associated with barriers to accessibility and resources [125], such as these. Thus, the recommendation to implement a BBAP approach for CNCP is non-exclusive and low-risk, and requires little in terms of resource investment.

8. Conclusions

Due to abundant evidence of the synergy between ABCD-SP and worsening negative sequelae of CNCP, care planning to assess and address ABCD-SP via a BBAP should be a foundational part of the CNCP treatment.   While a multidisciplined approach is ideal, the role of the individual pain clinician is poised to have a profound effect on a patient's formation - and either maintenance or dissipation - of ABCD-SP, which is a determinant of pain severity and morbidity. CNCP is a multifaceted bio-psycho-social diagnosis, and treatment requires a complex, holistic approach. Maximizing every treatment avenue available is imperative to improve CNCP-related outcomes on the individual and public health fronts. Utilizing a better-practice BBAP is a low risk, low-cost intervention that has the potential to yield high gains on an individual and public health level at a time when gains are sorely needed.

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