Refractory Headache or Refractory Patient? Issues of Locus of Control in Chronic Daily Headache (CDH)

Sarah E. Trost, Matthew T. Seipel, Emily J. Kalscheur, and Rebecca C. Anderson

Introduction

The treatment of chronic daily headache (CDH) can be a challenge for both patient and provider. While many patients find relief with available treatment options, some patients continue to experience intractable symptoms despite the best efforts of their treatment team. In this scenario, it is not uncommon for patients to become frustrated, expecting their provider to do more to treat their pain. In the same way, providers may become frustrated that a patient's pain remains unchanged and speculate how the patient may be contributing to the maintenance of the status quo. In short, treatment can become stuck. The psychological construct of locus of control has much to offer in understanding this dynamic between patient and provider and to help each move toward a more positive treatment outcome.

In this chapter, we present an overview of locus of control and the related concept of self-efficacy and discuss findings from the empirical literature relevant to the treatment of CDH. Next, we provide a broad overview of two psychosocial interventions, cognitive-behavioral therapy and motivational interviewing, both of which can be used to increase a patient's sense of control over the management of their headaches as well as the self-efficacy to make necessary behavioral changes. Common assessments and the use of biofeedback in the treatment plan are also discussed. We conclude by offering providers suggestions to increase both patient and provider locus of control and self-efficacy to optimize the course of treatment. Concepts are illustrated in a case study.

S. E. Trost (✉) · R. C. Anderson
Department of Anesthesiology, Medical College of Wisconsin, Milwaukee, WI, USA
e-mail: strost@mcw.edu

M. T. Seipel
Department of Psychology, Iowa State University, Ames, IA, USA

E. J. Kalscheur
Department of Psychology, Rosalind Franklin University of Medicine and Science, North Chicago, IL, USA

Department of Anesthesiology, Medical College of Wisconsin, Milwaukee, WI, USA

Locus of Control

Locus of Control Defined

The locus of control (LOC) construct was originally introduced in Rotter's social learning theory of personality [1] to characterize the extent to which people believe the outcomes of events in their lives are controlled by themselves or by external factors (e.g., other people, chance). Rotter emphasized that LOC is a continuum, ranging from internality to externality, rather than a

dichotomous typology. For example, a person with a more strongly internal LOC may attribute their ability to fall asleep to their own capacity to relax their body, yet they may also acknowledge the contribution of external factors such as room temperature and street noise. Additionally, each person can be thought to exhibit a global LOC orientation, as well as varying LOC for specific life domains (e.g., health, work, romantic relationships), with internal LOC generally associated with more positive outcomes [2]. The application of LOC theory and research has guided practice in a variety of domains, including health psychology, clinical psychology, and medicine.

Health LOC

The concept of LOC has been applied to health since Rotter introduced it, and a health-specific LOC construct emerged in the literature in the early 1970s. Wallston and Wallston provided a simple definition of health LOC (HLOC): "the degree to which individuals believe that their health is controlled by internal versus external factors" [3], p. 68. Initially HLOC was conceptualized as a unidimensional construct, with its first formal measure classifying individuals as either "health externals" or "health internals" [4]. Shortly thereafter, a new paradigm and associated measure emerged that conceptualized HLOC as multidimensional, involving internal LOC and two forms of external LOC. Specifically, it divided external HLOC into two distinct components: powerful others (e.g., physicians, family members) and chance [5]. Thus, an individual with external HLOC could to varying degrees believe their health is contingent upon the acumen of their medical providers as well as fate. This multidimensional measure has since been adapted to assess LOC relative to a specific illness or disease (as opposed to overall health), as well as to include a higher power (i.e., God) as a third type of external locus.

HLOC has demonstrated significant relationships with health behaviors and outcomes in various populations. The three predominant types of HLOC were significantly related to self-rated global health in a recent study: the relationship was positive for internal HLOC and negative for chance and powerful others HLOC [6]. Another recent study found chance HLOC to be associated with deficits in health promotion behaviors (e.g., physical activity, usage of preventative healthcare, health information-seeking) [7]. Higher levels of internal HLOC have also been associated with better treatment adherence in patients with type 2 diabetes [8], higher quality of life and physical functioning in recently hospitalized older adults [9], and adolescents' engagement in positive health behaviors [10]. Stronger internal HLOC, in addition to lower powerful others HLOC, was also associated with a greater likelihood of patients with coronary heart disease returning to work [11], as well as improved physical functioning in patients with chronic pain [12]. Conversely, in a sample of cancer patients, internal HLOC was associated with higher risk of depression, whereas powerful others HLOC was associated with lower risk of depression [13]. Examining newer conceptualizations of HLOC, a stronger belief that a higher power determined health outcomes has also been associated with lower treatment compliance (e.g., asthma medication adherence) [14]. Attention is now turned to a growing niche in this literature: headache-specific locus of control.

Headache-Specific LOC

General HLOC was naturally extended to research and treatment conceptualization in the headache domain, but experts in this area quickly began to question if chronic headache patients attributed control of their headache symptoms to the same source(s) as their overall heath, as well as whether simply imputing the word "headache" into existing HLOC measures would provide accurate and useful information. The construct of headache-specific LOC (HSLC) first appeared in the literature in 1990, with the publication of the headache-specific locus of control scale (discussed further in *Assessments* below) [15]. This measure was developed from new, expert-generated items, as well as adapted

items from the multidimensional HLOC scale. A similar three-factor structure was upheld in the HSLC scale (i.e., internal LOC, chance LOC, and healthcare professionals LOC), and it demonstrated incremental validity by explaining significant variance in outcomes (e.g., headache frequency and intensity) beyond that accounted for by the general HLOC scale.

The initial validation of the HSLC scale yielded interesting results that illustrated the practical impact of HSLC for chronic headache patients [15]. Chance HSLC was positively associated with headache-related disability, physical complaints, depression, and maladaptive coping strategies. Healthcare professionals HSLC was positively associated with level of medication use and preference for medical treatment. Internal HSLC was positively associated with preference for self-regulation treatment. Additionally, all of these associations remained significant after controlling for headache frequency and intensity, which suggests that HSLC is a salient treatment consideration for chronic headache patients. The psychometric properties and predictive validity of the HSLC scale were independently validated shortly thereafter, with scores on the three subscales differentiating chronic headache patients from non-patients with less severe headache symptoms [16].

These early findings have been largely supported by ensuing research, with many studies highlighting additional nuances and complexity in the relationships between HSLC and headache-related outcomes [17–19]. However, the evidence has been particularly consistent that high chance and healthcare professionals HSLC are associated with poor headache-related outcomes. A recent study found both chance and healthcare professionals HSLC were related to lower quality of life [17]. Another recent study found higher chance HSLC was associated with greater symptom chronicity [20]. Healthcare professionals HSLC previously demonstrated a positive association with headache-related disability [21]. Another earlier study also found greater chance and healthcare professionals HSLC were predictive of greater pain intensity and subjective impairment [22]. Thus, research suggests that patients who believe their headache pain is due to chance or the skill of their doctor fare more poorly than those who do not have such external attributions.

The direct relationship between internal HSLC and headache-related outcomes has been less clear. On the one hand, some researchers have found internal HSLC was related to impairments in quality of life and emotional functioning [17], as well as greater headache-related disability [18]. However, other researchers have found that internal HSLC was associated with lower levels of depression and that it moderated the relationship between headache pain severity and depression [23]. Additionally, some evidence suggests that internal HSLC may have an indirect positive association with quality of life by way of self-efficacy (discussed later in this chapter) [18], and researchers have noted that behavioral treatments (e.g., behavioral migraine management) that increase internal HSLC are effective in decreasing migraine-related impairment [19].

In a recent article, Grinberg and Seng offered the following attempt to reconcile the discrepant findings regarding internal HSLC:

It is possible that internal HSLC is multifactorial; perhaps internal HSLC is adaptive in relation to headache-related phenomena that are indeed controllable by the individual (e.g., stress management, migraine medication-taking behaviors), whereas, internal HSLC is less adaptive in relation to phenomena which the individual may exert little influence (e.g., the presence of migraine), partly due to the relationship with anxiety and emotional migraine-related quality of life impairments[…] Although effective behavioral treatments increase internal HSLC, higher internal HSLC in the absence of migraine management tools taught during behavioral treatment may be maladaptive [17] *pp. 140–1.*

Thus, the relationship between internal HSLC and headache-related outcomes appears to be context-dependent and is likely affected by the type of outcome measured, as well as the presence of symptom management tools and supports.

Overall, the dimensions of HSLC are clearly salient in headache patient outcomes. This makes

HSLC an important consideration in and potential target of medical and psychosocial interventions, with its utility optimized when regarded alongside other psychological constructs such as self-efficacy.

Self-Efficacy

Self-efficacy (SE), introduced in 1977 as a key construct in Bandura's social cognitive theory, is defined as a person's belief in his or her ability to complete a specific task or be successful in a specific situation [24]. Additionally, SE has also been regarded as a broader individual difference construct in which a person possesses a general belief regarding his or her ability to complete *any* task that they encounter. SE is typically considered to be moderately to strongly related to LOC, and some scholars have even suggested that the two may be markers of a higher-order psychological construct [25]. However, the relationship between these two constructs is not perfect, as someone could believe that a behavioral outcome is within their control (internal LOC), but not think that they have the ability to achieve the desired outcome (low self-efficacy). Further, Luszczynska and Schwarzer [26] noted an important distinction in that LOC beliefs do not necessarily imply subsequent action, whereas SE beliefs are by nature prospective and operative.

Like LOC, SE was quickly applied to medicine and behavioral health. An early review identified two pathways by which SE influenced health. First, SE was directly related to the adoption of health promotion behaviors (e.g., smoking cessation, condom use). Second, SE impacted the physiological stress response in bodily regions such as the endogenous opioid and immune systems, which in turn exerted an influence on health and illness [27]. Much research has applied SE to pain management, broadly defined. For example, in rheumatoid arthritis patients, SE was positively associated with active efforts to prevent and manage pain [28]. In fibromyalgia patients, SE was negatively associated with maladaptive pain behaviors [29]. SE has also been associated with increased pain tolerance in a non-clinical sample [30].

Unlike LOC, standardized measures of health-related SE have been less prevalent. A notable exception is the Arthritis Self-Efficacy Scale, which has been widely used since 1989 and has demonstrated good validity and reliability [31]. The first headache-specific SE scale appeared in the literature in 1993, and it focused on SE regarding the prevention of headaches [32]. The Headache Management Self-Efficacy (HMSE) scale (discussed further in *Assessments* below) was published in 2000 and continues to be the most cited measure of headache-specific SE today [18]. It extended beyond beliefs about preventing headaches to include beliefs about managing headaches and headache-related disability, which is noteworthy given that for most patients headaches are difficult to predict and prevent. Recently, a measure was also introduced that targets SE specifically for acute headache medication adherence, an important component of treatment for most chronic headache patients [33].

The initial validation of the HMSE scale illustrated the relationships of HMSE with HSLC and headache-related outcomes. HMSE was positively associated with internal HSLC, negatively associated with chance HSLC, and did not display a significant relationship with healthcare professionals HSLC. Patients' coping strategies were able to be discriminated based on HMSE, such that patients who used positive coping strategies (e.g., cognitive restructuring, coping self-statements) had significantly higher HMSE scores. HMSE was also associated with lower levels of headache-related disability and less severe headache symptoms, and it explained unique variance in headache-related disability beyond that accounted for by headache severity and HSLC. HMSE was not significantly related to level of depression [18].

The linkage between HMSE and headache-related disability was replicated in a recent study that found HMSE was negatively associated with disability and also that HMSE significantly mediated the relationship between pain severity and disability [34]. An earlier study also confirmed this linkage in primary care headache patients [35]. Additionally, a body of literature has also

found SE to mediate or moderate outcomes of several headache treatments (e.g., biofeedback, pharmacological, cognitive-behavioral) [36].

Thus, while the direct relationships between HMSE and HSLC and headache-related outcomes are fairly clear, such that greater HMSE and internal HSLC are generally associated with positive functioning and treatment outcomes, the nature of indirect relations incorporating HMSE and HSLC is less clear. For example, Seng and Holroyd [19] discussed how "clinical wisdom" suggests that that HMSE moderates the relationship between HSLC and treatment outcomes, yet the question has received minimal empirical attention. Further, the directionality of a potential moderation effect remains disputed. That is, does higher baseline internal HSLC enable patients to make greater HMSE gains during treatment, or do patients with lower baseline internal HSLC see more improvement in HMSE because they simply have more room to change [19]? More research is needed to refine our understanding of how HSLC and HMSE jointly impact headache symptoms, impairment, and treatment outcomes.

Psychosocial Interventions for CDH: Cognitive-Behavioral Therapy and Motivational Interviewing

Illness, including chronic headache, can be conceptualized not only as a biological phenomenon but also as a social phenomenon. An individual suffering from illness can take on sickness as their social function, thereby adopting a "sick role" [37]. The sick role script reads that the patient is relieved of his or her usual responsibilities in order to focus on regaining health. The assumption is that the patient wants to achieve wellness as quickly as possible, condones the undesirability of their illness [38], and defers responsibility to the medical professional. These expectations set the stage for an externally based LOC and low SE in the management of the health condition, a combination commonly encountered clinically in chronic headache populations [19]. Within this framework, the patient may lack both

(1) the understanding that certain behaviors may cause or at least influence their headaches and (2) the confidence in their ability to modify behavior in order to ameliorate or reduce the severity of their headaches. Thus, enhancing internal LOC and increasing SE for modifiable health behaviors are targets of psychosocial interventions for the CDH population, including cognitive-behavioral therapy and motivational interviewing, discussed next.

Cognitive-Behavioral Therapy

Cognitive-behavioral therapy (CBT) is recognized as the leading psychological treatment for individuals with chronic pain, including CDH [39]. In short, CBT for chronic pain aims to reduce pain and psychological distress, as well as to increase functionality. Common goals include decreasing behaviors that adversely affect the pain condition (e.g., erratic sleep, medication overuse); increasing adaptive behaviors (e.g., regular exercise, implementation of stress management tools); identifying, challenging, and replacing unhelpful thoughts and beliefs (e.g., "I can't do anything with this headache"); and increasing SE that one can manage or influence pain [40].

As many patients will attest, headache symptoms are often triggered and/or exacerbated by stress. CBT teaches patients to notice how thoughts influence the stress response. In our own practice, we often ask patients whether there are things they could think about that might make their headaches worse. The answer is a resounding "yes" with work demands, financial strain, deadlines of various sorts, and marital and parenting difficulties as commonly identified stressors that exacerbate headache pain. Through use of a daily thought record, patients learn to notice thoughts relating to stress, pain, and the impact of pain on daily functioning. Often patients identify thoughts that can be characterized as catastrophizing: "I can't deal with this pain. Nothing helps. No one understands how I suffer." A goal of CBT is to help patients recognize such thoughts, gently challenge them, and to replace with thoughts that

have less of a deleterious impact on a patient's mood, level of tension, and subsequent ability to function (e.g., "I've functioned with this level of pain before. I can do it again."). Patients learn that they have the ability to modify their thoughts and to thereby exert influence on their pain experience.

In addition to thought monitoring, relaxation training is an aspect of CBT that also teaches patients how to influence their experience of pain. Penzien et al. [41] identify *progressive muscle relaxation (PMR), autogenic training,* and *meditation/passive relaxation* as forms of relaxation training commonly used to treat chronic headaches. PMR has been used since the 1930s as a treatment to lower anxiety [42]. Patients practice tensing and relaxing muscle groups throughout the body. With continued practice, patients become skilled at recognizing the first signs of tension in the body and to effectively and quickly relax. Autogenic training involves patients using the suggestions of heaviness, warmth, calmness, and ease to promote a sense of deep relaxation in the body. For example, a patient will subvocally or mentally repeat the suggestion, "My arms are heavy and warm," before moving to another part of the body. Put simply, meditation and passive relaxation involve focusing on an anchor (e.g., breath, words) to calm both mind and body. When thoughts wander, they are redirected to the anchor. Relaxation training as a whole aims to enhance patients' sense of control over physiological responses, in particular sympathetic arousal [41]. In other words, patients learn they are capable of exerting influence over the level of tension in the body and their subsequent experience of pain.

Biofeedback and Assessments

Biofeedback is used alongside CBT techniques to teach headache patients how to reduce physiological arousal. For the treatment of chronic headaches, thermal biofeedback (measuring finger temperature) and electromyographic (EMG) biofeedback (measuring muscle tension) are often used [41]. Heart rate variability biofeedback can also be employed. Patients learn to use breathing and cognitive strategies in real time to calm the body, and audial or visual feedback allows patients to know when sympathetic arousal is reduced. Over time, patients learn to recognize tension in the body and lower arousal before tension levels become high.

The effectiveness of biofeedback for headaches has been documented for decades (see, e.g., [43, 44]), and two recent meta-analyses [45, 46] found sound evidence supporting the effectiveness of biofeedback training for the treatment of headache pain. In addition, multiple studies demonstrate that when coupled with medical therapy, biofeedback enhances outcomes for headache patients [47–49]. A recent study in our own clinic found biofeedback to be an effective strategy to manage headache and other forms of pain [50]. Participants ($N = 72$) reported a significant reduction in self-reported pain and distress immediately following biofeedback sessions, with pain and distress ratings decreasing more than a point on a 0–10 rating scale. While decreases in pain and distress were not maintained from session to session, patients' scores on a measure of catastrophizing significantly decreased across biofeedback sessions, suggesting that beliefs in one's ability to cope with pain can be enhanced over time through a biofeedback intervention.

Cognitive factors such as LOC and SE influence the patient's participation in headache management, including medical adherence and the monitoring and management of triggers [51]. The assessment of these cognitive constructs in the context of CBT and other psychosocial interventions serves a number of purposes: (1) to better understand the patient's beliefs about chronic headache before beginning treatment, (2) to inform the treatment plan by including targeted interventions aimed at such beliefs and bolstering confidence in the patient's skills to prevent and manage headaches (i.e., increasing SE and internal LOC), and (3) to examine changes throughout the treatment process. A number of standardized assessments have been developed, three of which are described below. The first two directly assess the concepts of LOC and SE, while the final assesses LOC indirectly through the construct of catastrophizing.

Headache-Specific Locus of Control (HSLC) Scale

The HSLC scale is a 33-item measure consisting of three subscales: (1) healthcare professionals LOC (e.g., "Following my doctor's medication regimen is the best way for me not to be laid-up with a headache"), (2) internal LOC (e.g., "My actions influence whether or not I have headaches"), and (3) chance LOC (e.g., "My headaches are beyond all control"). Participants respond to each item using a 5-point Likert scale where 1 = strongly disagree and 5 = strongly agree. For each subscale, higher values indicate greater LOC ascribed [15, 16].

As discussed earlier in the chapter, the subscales have demonstrated good internal consistency (α's ranging from 0.80 to 0.89) and adequate 3-week test-retest reliability (*r*s ranging from 0.72 to 0.78) [15]. Additionally, expected relationships have been demonstrated with other related measures: the chance LOC subscale is associated with catastrophizing ($r = 0.44$), the internal LOC subscale is associated with preference for self-regulation treatments ($r = 0.21$), and the healthcare professionals LOC subscale is associated with preference for medical treatment ($r = 0.45$) [15]. Versions of the HSLC have been validated for Spanish-speaking populations [52].

Headache Management Self-Efficacy (HMSE) Scale

The HMSE scale consists of 25 items measuring the patient's confidence in his or her ability to apply behavioral skills to prevent or manage recurrent headaches [18]. Participants respond to items (e.g., "I can reduce the intensity of a headache by relaxing") on a 7-point Likert scale where 1 = strongly disagree and 7 = strongly agree with higher scores indicating greater headache management SE. The HMSE has shown good internal consistency ($\alpha = 0.90$)[18] and predictive validity (described previously in this chapter).

Pain Catastrophizing Scale (PCS)

The PCS is a 13-item scale assessing thoughts and feelings associated with pain. Three dimensions of pain catastrophizing are measured and constitute subcategories of the scale: rumination (4 items), magnification (3 items), and helplessness (6 items) [53]. Participants respond to each item using a 5-point Likert scale (where 0 = not at all and 4 = all the time) in reference to the degree to which they have specific thoughts and feelings when experiencing pain (e.g., "There's nothing I can do to reduce the intensity of the pain"; "I can't seem to keep it out of my mind"). Total PCS scores are calculated by summing the scores of all items, with higher scores representing a higher tendency to catastrophize pain. The items included in each subcategory are also summed to provide subscale scores. Scores ≥30 indicate clinically significant levels of catastrophizing [53].

The PCS has been validated for a many different languages, including Arabic [54], Korean [55], Hindi [56], Turkish [57], Brazilian [58], Sinhala [59], and Italian [60]. The scale has also been validated for use in children, including German- [61] and Catalan-speaking [62] children. Additionally, a short form of the PCS has been validated for English-[63] and Japanese-speaking populations [64].

In sum, assessments can be an effective tool to measure client LOC and SE, providing objective data to observe the process of change. Additionally, they can serve as a useful springboard for conversation about the patient's capacity to influence headache pain, one that may increase motivation to make necessary behavioral changes.

Motivational Interviewing

Motivational interviewing (MI), a therapeutic intervention that specifically explores and addresses the difficulties inherent in trying to modify behavior, has powerful potential to move CDH patients toward lasting behavioral change. A growing body of literature demonstrates that MI can be effectively delivered in medical settings by a range of providers with minimal investment of time [65]. Reviewed in a recent meta-analysis, MI was successfully employed to address a variety of diverse health concerns including body weight, alcohol and tobacco use, dental outcomes, sedentary behavior, HIV viral

load, and optimal utilization of physical therapy [65]. Few empirical studies exist that examine MI exclusively with the CDH population (although see [66] for a study on telephone-based MI for adolescent chronic headache). However, the behavioral changes often needed by individuals with CDH (e.g., prioritizing sleep, exercise, nutrition, and daily relaxation) – and the associated ambivalence in making such changes—lend themselves well to modification via MI. While a thorough review of MI is beyond the scope of this chapter, Rollnick et al. [67] provide an excellent resource on MI in healthcare settings.

In short, MI is "a client-centered, directive method for enhancing intrinsic motivation to change by exploring and resolving ambivalence" [68], p. 25. It is client-centered in the sense that it is an open, respectful, and nonjudgmental way of being with clients. It is directive in that the provider chooses what to attend to and therefore is gently guiding the session to elicit from patients their own motivations for behavior change.

MI is based in part on the Stages of Change model developed by Prochaska and DiClemente [69]. According to this model, change happens gradually, in stages. In the first stage of change, *precontemplation*, a client does not acknowledge that they have a problem with a given behavior. The task of the provider is to raise awareness through education and feedback. In the realm of CDH, education can be on the contributory roles of medication overuse, missed meals, poor hydration, or inadequate sleep to headache risk, for example. Feedback can be given in the form of assessment results (discussed above), which allows the patient to see how their pain behaviors and beliefs compare to others as well as to themselves across time. In the second stage of change, *contemplation*, a person experiences ambivalence about changing a given behavior. A patient may want to make time to exercise most days, and she may know it will help her headaches, but she also does not believe she has enough time to exercise and views exercise as taking away from other work and home responsibilities. The provider's role is to help the patient explore her ambivalence and ultimately to resolve it such that she is ready to make the first steps toward behavior change.

When a person is leaning toward making a behavior change, he or she is said to be in *preparation*. Here is where the provider works with the patient to explore and identify change strategies by offering a menu of options. In the *action* stage of change, a person chooses a strategy and makes a clear commitment to behavior change. *Maintenance* follows, whereby the provider checks in to see if what the patient is doing is still working, in order to maintain gains and continue skill building. Lastly, an integral component of the model is *relapse*, when a person stops a healthy behavior and/or resumes an unhealthy behavior. Relapse is reframed as a more forgiving "slip," and the patient and provider evaluate what went wrong, with the patient ultimately recommitting to change.

The underlying philosophy of MI is to meet patients where they are in the Stage of Change model and to work with them to increase their motivation for change. The question is "for what is this person motivated?" (e.g., to contemplate, to take action). MI understands that pushing a person toward change when they are not committed will result in resistance [67, 70].

A core clinical principle in MI is that of developing discrepancy [70]. The provider works with the patient to develop the discrepancy between their current behavior and current values. Put another way, the patient is prodded to discuss the difference between what they say they want and what they are actually doing. The goal of developing discrepancy is to maximize opportunities for the patient to present reasons for change (also called "change talk"; see [67, 70]). In other words, the aim is for the patient to engage in problem recognition (e.g., "I guess my stress level makes my headaches worse"), express concern about problem ("I can see that staying up late to work is literally hurting me"), state advantages of change ("My children would like it if I exercised with them"), express SE ("I think I could make self-care a priority if I decided to"), and/or verbalize intention to change ("I've got to do something").

While it is the patient that presents reasons to change, the provider can help to evoke change talk via simple questions such as, "What is truly important to you? How does this fit with

behaviors that contribute to CDH?" For example, a client might state that being a good parent is of primary importance. The provider can [gently] wonder how a lack of self-care—that ultimately leads to lost time with family—fits with such a value. Ultimately, the goal is for the patient to see that self-care supports the priority of being a good parent. Other useful questions include, "What worries you about your behavior? What do you think will happen if you don't change your behavior? What encourages you that you can change if you want to?" Discussing the positive as well as the negative aspects of change is also an important conversation to have, so that the patient makes a choice to engage in behavior change having thought about all sides of the issue.

Other core clinical principles include providing empathy for the patient's situation, treading carefully when clients show resistance to change (e.g., by responding "the choice is up to you. You can decide to do what you like"), and supporting a patient's SE to make changes by asking them to reflect on other times in their lives where they made a difficult change and followed through with it.

In MI, motivation for change comes from within and is not imposed from without. Through meaningful conversation, MI cultivates internal resources for change, leaving the client with the sense that change is within his or her own control and not something the provider can make happen for him or her. In this way, MI is a tool to support SE and increase internal HSLC.

LOC and SE: Suggestions for the Provider

Healthcare providers treating headache patients may face frustrations of their own. The provider may be caught between wanting to help the patient find a means to manage headaches and struggling when nothing appears to be working. Sometimes the refractory headache patient is considered by the provider to be difficult. Indeed, they may be difficult to manage medically, especially if all reasonable options have been trialed, and providers may feel helpless in the face of dwindling options to offer. Refractory patients are often high utilizers of services. Some are seeking answers, treatments, and cures, while others may experience anxiety, mood disorders, substance abuse issues, and personality disorders. Provider workload may increase the perception of a patient being difficult, with healthcare system pressures such as reduction of costs and increased productivity playing a role [71].

Just as patient SE is important for the effective treatment of CDH, so is provider SE. Understanding the needs of headache patients can bolster a provider's SE to effectively treat this population. Cottrell and associates [72] conducted a focus group to identify the perceptions and needs of migraine patients. The results suggested that patients seek better understanding of their migraines and information as well as pain relief. They would like a collaborative relationship with their physicians combined with a team approach to treatment. Participants identified areas of concern, which included the impact of their headaches on family, relationships/social functioning, and employment, as well as issues related to physician care. Physician care factors involved the provider's willingness to consider alternative treatments, the ability of the provider to listen, and a sense of feeling dismissed by providers who failed to take them seriously. Ability to obtain insurance coverage of prescribed medications was also a concern. Patients in the focus group recognized that tools related to technology may be available to them and appreciated physicians who understood this fact. Providers who acknowledge such patient concerns are in a better position to more effectively meet the needs of their patients.

There appear to be specific patient and physician characteristics that contribute to the perception that a given headache patient is difficult to manage [72, 73]. Challenging patients include those with refractory headaches, psychiatric pathology, multiple unexplained symptoms, and substance abuse difficulties. Interestingly, there are physician characteristics associated with the provider perception that a patient is difficult. Those physicians who are younger, under greater

stress, and who do not utilize collaborative treatment models are more likely to perceive a patient as challenging. General principles that might prove helpful in the management of the refractory patient include evaluating for possible mental health or substance abuse problems followed by specific treatment if identified as useful. A shift from the treatment philosophy of searching for a cure in favor of the goal of management and the use of written agreements that outline conditions of treatment can prove valuable in the approach to refractory patients. Lastly and importantly, use of an integrated, multimodal treatment approach that includes behavioral and nonpharmacological treatment options is suggested.

In the treatment of headaches, there are modifiable risks and those over which the patient has less capability to change [74]. Those risks over which the patient has the ability to exercise some element of control or may modify include such factors as sleep-related difficulties, obesity, medication overuse, allodynia or increased pain sensitivity, and nausea or prolonged headache duration. Non-modifiable risks include age, sex, genetic background, head and/or neck injury, socioeconomic status, and uncontrollable major life events (e.g., job loss). Headache providers should encourage patients to gain a sense of SE for modifiable risks. As discussed above, CBT or MI can prove useful in reframing the patient's sense of control over modifiable risks and increasing efficacy to make positive changes.

Once headaches have transitioned from episodic to chronic and daily, they become more difficult to manage. Management of the risk factors prior to that happening is very important. Risk factors for transition from episodic to chronic daily headaches include obesity, headache frequency, medication overuse, and psychiatric comorbidity [75]. Often these patients are difficult to treat due to multiple factors, not the least of which is nonadherence. They should be seen frequently and educated about the mechanisms of headache. Treatment favors a collaborative relationship between patient and provider and the use of behavioral strategies to help the patient take an active role in managing their headache disorder and the therapeutic program [75].

Rains and colleagues [76] identify four important dimensions of care in the management of the migraine patient, which include administration, psychoeducation, behavioral factors, and social support. In the area of administration, they suggest scheduling regular contact and rapport building, providing verbal and written recommendations, screening for psychiatric comorbidities, tracking compliance, encouraging participation of significant others, and assessing and treating psychiatric comorbidities. Psychoeducation encompasses providing patient education about migraines, use of printed materials, patient involvement in planning, and education related to adherence and health-related behavior change. The behavioral piece includes providing a simple daily health regimen, training the patient in self-monitoring of compliance, understanding and managing stimulus control (such as known headache triggers), using medication contracts, enhancing SE, and reinforcing successes. Lastly, social support factors such as provider communication and support, a collaborative therapeutic alliance, and spouse and family support offer potential benefit for headache management.

With these factors in mind, take the illustrative case of Dr. Nikou and Ms. Connelly to see how each might alter their approach or belief systems to effect a better patient outcome.

Case Study

Ms. Connelly, a 40-year-old female, presents to the clinic complaining of sharp pain at the base of her neck that radiates behind and over her head. She meets with Dr. Nikou, a young physician who just began his practice at the clinic less than a year ago. Besides having a heavy clinical load each week, Dr. Nikou is also developing a research program within the clinic and is finding the day he sees Ms. Connelly to be an especially busy day. Dr. Nikou introduced himself to the patient and began taking her medical history. Ms. Connelly rated her pain today as 8/10 (with 10 being the worst). She reported a 3-year history of severe daily headaches and has found

little to no relief with previous prescription trials. Ms. Connelly is a mother of three elementary school-aged children who are involved in many after-school activities. She previously worked as a real estate agent but is currently unemployed due to her daily headaches. While she has a history of anxiety dating back to high school, for which she took a short-term anxiolytic, her anxiety has recently increased due to changes in her husband's work schedule. She shared this with Dr. Nikou, but she did not feel that he was listening because he was typing on the computer. Ms. Connelly reported drinking three to four cups of coffee daily and is a regular Diet Coke drinker. She does not sleep well: she averages 4–5 h per night and reports difficulty with early morning awakenings. She also regularly skips meals because she "forgets" which has resulted in a loss of 10 lbs. unintentionally over the past several months. Dr. Nikou inquired about headache triggers, but Ms. Connelly was unable to identify any: "They just happen. I can't predict it." She feels helpless, as no medications have helped and no one has been able to identify the cause of her headaches. This has become very unsettling to her, leading her to seek out medical advice from a number of specialists who have helped to reduce her pain to a 5/10 temporarily (via injections, physical therapy, and chiropractic care), but have not been able to cure her from her headache pain. She has begun to identify as a sick person, and she spends much of her day lying on the couch or looking up her symptoms online to try to find a cause and possible cure for her pain. She reported she has failed to keep a headache diary because she does not have time. She also has little energy to engage in relaxation strategies. Dr. Nikou, with little time left before needing to meet the next patient, said he would change the dose of an existing medication and told her to make a follow-up visit for 6 weeks later. Ms. Connelly left the clinic to get her prescription, but found herself feeling dejected and wanting a plan to address her headaches so that she can return to work.

There may be ways for Dr. Nikou to better meet the needs of this patient and the patient may benefit from an adjustment in both behavior and expectations. First, Dr. Nikou might do well to adjust the location of his computer so that he can make eye contact with the patient and enter data into the medical record at the same time. He could use reflective listening strategies such as "I hear you saying that …" or "I understand that when … you…." Summarizing what the patient says will help them to feel heard, and ending the visit by asking if there are any remaining questions gives the patient a last opportunity to get clarification. Additionally, Dr. Nikou might ask a nurse or medical assistant to come back in to offer patient education. He might want to talk to the patient about her expectations and explore what realistic outcomes for treatment might look like. In addition, he might identify if there is a psychologist, therapist, or social worker serving the clinic who could work with Ms. Connelly to manage her pain nonpharmacologically, given that the patient is open to doing so.

Ms. Connelly appears to expect Dr. Nikou to have the answers to her headaches, and she has not taken an active role in her treatment such as keeping a headache diary (i.e., external LOC). Additionally, she appears to want a cure, which might not be a realistic expectation for her. Utilizing strategies such as guided imagery, biofeedback, breathing approaches, avoiding headache triggers, and trying yoga or Tai Chi might build a sense of internal LOC in the management of her pain. For example, in the biofeedback study presented earlier, Wilson, Melchert, and Anderson [77] discovered that when patients noted a reduction in pain and distress during biofeedback, they reported a sense of gaining greater control of their pain. Successfully employing stress management strategies and verbalizing the importance of self-care will help her to build a greater sense of SE.

Generally speaking, a team approach where the provider listens and works together with the patient to establish reasonable and attainable expectations leads to a better outcome. When patients accept that there may be no magic bullet for their headaches and recognize they can actually influence their headaches through the use of self-care strategies, they tend to report greater satisfaction with their care.

Conclusion

When patients continue to struggle with CDH despite multiple interventions, treatment can become stuck, with both patient and provider wondering what the other is doing (or not doing) to fix the problem. The construct of LOC, and its application to the treatment and management of CDH, offers fruitful avenues to explore to help both patient and provider move forward toward positive treatment outcomes.

In this chapter, we reviewed literature on LOC and the related concept of SE as they relate to health and headaches specifically. As a whole, the literature suggests that internal LOC, as opposed to chance or healthcare professionals LOC, is associated with favorable treatment outcomes for modifiable health behaviors, such as sleep, exercise, nutrition/weight management, relaxation, and stress management. High SE can enable a patient to make necessary behavioral changes to influence their experience of and susceptibility to pain.

Psychological treatments can be employed to modify LOC and SE. In particular, CBT and MI show patients that they have the capacity to influence health outcomes. CBT teaches skills and strategies to reduce pain and psychological distress, with patients learning that they can use such strategies in real time to make a lasting impact on their functioning. MI has much to offer both patients and providers alike in moving patients closer toward internally driven change. Even a refractory patient has the potential to shed this label when they are able to verbalize the importance of self-care behaviors and actualize their commitment to change.

Lastly, we encourage providers to recognize the potential difficulty in working with CDH patients. By understanding the perspectives and beliefs common to this population, and recognizing that there are modifiable psychological variables that can benefit treatment, providers can increase their own LOC and SE to work collaboratively with CDH patients to achieve a favorable outcome.

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