

INVITED REVIEW

Biopsychosocial assessment and management of persistent orofacial pain

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Abstract

Persistent orofacial pain (OFP) presents as a range of conditions of complex aetiology which include interacting biological, psychological and social aspects. Biopsychosocial factors have an impact on the development, maintenance and severity of pain disorders as well as on their treatment. Since OFP is unlikely to be cured, given current knowledge, patients need to play an active role in using strategies to reduce their pain or the impact it has on their life. This is known as self-management and provides a firm foundation for tailored medical management strategies. Biopsychosocial considerations have an important role in supporting successful self-management. This review describes biopsychosocial factors that may be important to consider in routine care settings. Psychological factors that are known to affect outcome include anxiety and depression and, more specifically catastrophising and self-efficacy. Research into pain management in other conditions also stresses the importance of psychological flexibility, the ability to respond in a helpful way even when this involves maintaining awareness of difficult feelings and thoughts. Patients' understanding of their pain, including beliefs about its meaning and how it should be managed is also important. Social factors include communication and relationship-building in clinic, both of which are key. Outside the clinic, other social factors might compromise a patients' ability to engage in treatment, and clinicians need to be alert to their possible presence. Suggestions are made for incorporating biopsychosocial principles into routine assessment and treatment and for deciding when specialist referral to psychology services might be required.

Introduction

This review describes biopsychosocial factors that may be important to consider in routine care settings in relation to orofacial pain. Pain is known to be a complex experience which has a strong motivational component and cannot be accounted for by disease, injury or structural problems alone¹. The multifactorial nature of pain, including orofacial pain, is most accurately described in terms of interactions between biological, psychological and social factors² This is an

application of the biopsychosocial model of health and illness proposed by George Engel³, which has been widely adopted in international healthcare settings.

The current International Association for the Study of Pain (IASP) definition of pain reflects this complexity; 'Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage'⁴. Recently, alternative definitions have been proposed to more thoroughly describe the highly

personal nature of pain. Suggested definitions include 'an aversive sensory and emotional experience typically caused by, or resembling that caused by, actual or potential tissue injury'⁵ or 'a mutually recognizable somatic experience that reflects a person's apprehension of threat to their bodily or existential integrity'⁶.

The existing and proposed definitions of pain retain the critical recognition that an understanding of pain and its consequences cannot be limited to observable pathology. This is particularly the case when pain persists. Pain that has lasted for more than 3 months⁷ or beyond the time of normal healing⁸ is defined as 'chronic'. When pain becomes chronic (or persistent, the term favoured by many patients and used in this article) the pain itself is frequently the primary problem for patients.

Persistent orofacial pain (OFP) is associated with a high degree of complexity, uncertainty and personal impact⁹⁻¹¹. For most patients there is no single management strategy that is likely to resolve their pain. Attention to the broad spectrum of social and psychological factors that can potentially influence outcome is likely to be beneficial. Some patients will require specialist assessment and treatment by a clinical psychologist or equivalent professional; many more will benefit from treatment that is informed by an understanding of psychological principles within routine clinical appointments with their treating surgeon. Regardless of whether specialist psychology is required, routine clinical management can be enhanced by the integration of the biopsychosocial principles that are described below.

Aetiology and pathophysiology

Persistent OFP conditions are likely to arise from multiple risk determinants including biological (e.g., medical, physiological, genetic), psychological (e.g., thoughts and beliefs, feelings, behaviours) and social-environmental (e.g., injury events, relationships, status, resources) factors. Mechanisms by which these factors exert their impact are not fully understood but are likely to be different for each individual; the neuromatrix theory of pain¹² proposes one plausible theory for how the sum of these factors could be translated into the experience of pain. This theory proposes that a body-self neuromatrix generates various output patterns or 'neurosignatures' in response to multiple influences. Pain neurosignatures are related to programs developed for functional reasons to deal with, for example, post-injury, disease or chronic stress. They are

generated primarily through the neuromatrix and do not require active sensory input from the periphery in all circumstances.

Psychological factors including catastrophising¹³⁻¹⁵, low self-efficacy¹⁶, anxiety¹⁷ and depressed mood^{15,18} have been found to predict poorer prognosis and worse outcomes in persistent OFP. Social factors in persistent pain are also being recognised as increasingly important¹⁹⁻²¹.

Assessment and diagnosis

All of the factors below should be considered in the context of a dental or medical consultation which is responsive to the needs of the patient. The experience of persistent OFP often involves a good deal of uncertainty for both patients and clinicians^{9,10} which can lead to patients doubting themselves or feeling that their symptoms are not acknowledged or validated by others. The provision of a firm or provisional diagnosis will often help to resolve this uncertainty¹⁰ and can lay the foundation for a collaborative and trusting relationship to support further management. Providing patients with relevant education about the condition and the impact of biopsychosocial factors is important from the initial stage of evaluation and throughout treatment.

Many biological factors are relevant at initial assessment; these factors include those that are condition-specific (addressed elsewhere in this issue, e.g.^{22,23} etc), as well as those that are generic. Generic biological factors include sleep, general health and fitness, nutrition and a genetic predisposition to pain, all of which can influence pain either directly or through changing the capacity to respond to pain helpfully. Social and psychological factors may serve as maintaining or exacerbating factors for pain. They also contribute to the ability to engage in effective self-management²⁴ which is an important component of treatment for persistent OFP.

Social factors

From the beginning it is important to consider the impact of social factors within the consultation itself since they can have an important impact on patient engagement with the clinician's explanation of pain and treatment recommendations. Patients with pain prefer treatments to take their personal circumstances and individual life priorities into account²⁵. In order to address this point it is important that clinicians take the time to talk to their patients about their lifestyle and priorities. The interaction between

the patient and clinician is itself an important social encounter for patients; interpersonal skills such as showing respect, active listening and allowing the patient time to talk are important. This will encourage a warm and collaborative relationship between the patient and clinician which can be the basis for further discussion at the treatment stage.

Psychological factors

Depression has been consistently found to be related to symptom severity in persistent OFP. Using prospective methods, studies in Taiwan²⁶ and the United States¹⁵ demonstrated that individuals with depressive symptoms were at increased risk of developing painful temporomandibular disorders (TMD). These results have been supported for persistent OFP in general in an epidemiological study using data from the 1966 North Finland Birth Cohort Study¹⁸; patients who were classified as depressed at age 31 were 2.5 times more likely than those without depression to report persistent OFP 3 years later. Depression has also been linked to the risk of increased pain and disability in patients already diagnosed with persistent OFP^{15,27,28}. Stress¹⁸ and health anxiety¹⁷ have also been associated with an increased risk of developing persistent OFP.

Patients who have a history of anxiety or depression which precedes the onset of their persistent OFP may benefit from a referral to a clinical psychologist for help with anxiety and/ or depression as this could lead to improved self-management, pain intensity or pain disability²⁹. If anxiety or depression started after the onset of pain it is likely to be more beneficial for this to be managed in close collaboration with dental care either through early specialist referral to pain management services or the integration of psychological principles into routine care supported by collaborative working between colleagues from dental and psychology services. It is important however not to suggest that anxiety or depression cause pain or that improvements in anxiety and depression on their own are likely to lead to the resolution of pain. Such assertions are not supported by the complex multifactorial nature of pain and may be detrimental to the clinical relationship and ongoing management plan.

Simple self-report screening instruments can be helpful in identifying potential psychological risk factors that might warrant more detailed assessment. The four-item Patient Health Questionnaire (PHQ-4)³⁰ is a brief self-report screener for distress, based on individual symptoms of anxiety and depression.

Scores range from 0 to 12; a score of 6 or more warrants further discussion while a score of 9 strongly suggests a significant degree of anxiety and/or depression³¹. Patients with 'high disability' are also more likely to be more intensive consumers of healthcare services and may benefit from referral to specialist services from an early stage³². Disability can be measured, alongside pain intensity, by the Graded Chronic Pain Scale (GCPS)³³. International consensus guidelines suggest that referral to specialist, ideally multidisciplinary services is appropriate for patients with PHQ-4 scores of 6 or above and GCPS scores indicating disabling pain³⁴. In settings where more time is available, comprehensive DC/TMD (diagnostic criteria for temporomandibular disorders) guidelines can be followed for carrying out and interpreting a thorough assessment of biopsychosocial factors^{35,36}. Full guidelines and copies of the PHQ-4, GCPS and several other questionnaires are freely available with scoring guides available at www.iadr.org/INFORM/DC-TMD.

Management

The active use of psychosocial strategies by the patient to manage their pain and its impact on their life is important alongside any medical management strategies. This active involvement of patients in the management of their condition is known as self-management^{37,38}. Support for self-management is itself a form of treatment which healthcare staff provide in the form of explanation, teaching, guidance and follow-up; it is an iterative process of skills acquisition. Self-management for TMD is reflected in international treatment guidelines^{39,40} and it is equally as relevant to other persistent OFP conditions.

A collaborative relationship between the patient and healthcare provider is essential for successful self-management. Patients may initially believe that cure of their condition is the reasonable expected outcome following the assumed physical or medical intervention. However, it is much more likely with persistent pain that symptoms will continue at some level or recur and that patients will need to take an active role in managing them. Patients must therefore be able to take an active role in their own management, engaging in helpful habits to minimise pain and its impact and reducing exacerbating factors.

The psychological factors discussed below have been linked to the risk of poor prognosis in persistent OFP and are specific enough to guide the

clinician towards specific psychological management strategies. Many such strategies are suitable for routine use in clinic and will often be more effective when they can be integrated with other aspects of care including condition-specific treatment strategies.

It can be helpful to encourage patients to adopt or maintain healthy lifestyle habits which will support other, more targeted changes that are needed. Good nutrition, hydration, exercise and rest can be a foundation for specific treatment strategies and patients have a role in developing and maintaining healthy habits. In particular poor sleep^{41,42} is known to exacerbate pain. In some cases specialist help may be required with sleep but patients can play a part by following sleep hygiene guidelines such as maintaining regular bedtime, avoiding caffeine, alcohol or vigorous exercise shortly before bed, following a regular routine to wind down by bedtime and maintaining the bedroom for only sleep and physical intimacy.

In the following section we will consider how social factors may affect management of persistent OFP and how it may be possible to take these into account in clinic. We will then describe the psychological factors that have been researched in relation to persistent pain and discuss how each of these might impact on patient management.

Social factors

From a social perspective, the relationship between a practitioner and patient has an important impact on the patient. For example, experimental pain is perceived more intensely when participants feel their companions are unsympathetic⁴³. Invalidation of pain by others is associated with increased frustration, anger and low mood,⁴⁴ with some indication that invalidation by healthcare providers can be a factor contributing to increased pain over time⁴⁵. Treatment outcomes of patients with back pain are related to the quality of relationship between the patients and their care providers⁴⁶. Patients with lower socioeconomic status²¹, those who report dissatisfaction with their standard of living⁴⁷ and who perceive that their pain has a significant impact on other people²⁸ are all at increased risk of disabling pain. We recommend that clinicians ask patients if there are any personal circumstances that affect their pain or make it more difficult to manage and carefully take into account the circumstances that patients report.

Not all of the above findings originate from orofacial pain settings; however, all have been

documented in persistent pain populations and it is highly likely that the same mechanisms would hold true for orofacial pain also. Patients need to feel that their practitioner is listening and taking their concerns seriously. The time required in a consultation to adequately convey understanding and empathy to a patient with persistent pain and the many problems encountered with that pain will likely pay many dividends in increased patient engagement with the self-management aspects of their treatment plan and may have an independent impact on pain outcome. That time spent in consultation will also benefit the provider by improving the provider-patient relationship and thereby decrease provider stress as the slow process of even successful pain therapy unfolds.

Successful self-management of persistent OFP is likely to require behaviour change; such change will necessarily take place within a social context both influencing and being affected by others. Among 10 barriers to engagement with self-management in a clinical trial²⁴ five were related to social factors: lack of support from family and friends, lack of resources such as finance or transport, time constraints and other life priorities, lack of tailoring strategies to meet personal needs and difficult physician-patient interactions.

It is important to bear in mind that these five barriers may make it difficult for patients to follow treatment recommendations. In our experience, it is helpful when making recommendations for clinicians to ask patients about the main barrier that might make it difficult to follow the recommendations. This can be followed by a discussion and agreement about one or two things that might be helpful in overcoming this barrier. It is important to record such conversations in the notes and to inquire at the next appointment when further barriers and solutions may also be discussed.

Psychological factors

Below we describe a range of psychological factors which, based on extensive evidence, have an impact on persistent pain and can therefore be used to inform management strategies for persistent OFP. Unlike biomedical treatments that are expected to exert immediate and observable large impact, psychosocial treatments require time for the effects to be observed, and no one treatment strategy, by itself, is typically sufficient to address inter-related factors. Instead, active problem-solving by the clinician and corresponding treatment tailoring is required.

Self-efficacy

Self-efficacy refers to the confidence that an individual has in being able to exert a positive action on a given circumstance⁴⁸. Pain self-efficacy refers to the confidence to perform activities despite pain⁴⁹. High self-efficacy in patients with persistent OFP has been linked to positive outcomes^{16,50}. Self-efficacy is likely to be particularly important in persistent pain conditions since higher self-efficacy will support patients to continue to try to use active strategies to manage their pain even when doing so is difficult. Self-efficacy may be influenced by a range of factors outlined below; for example an accurate understanding of factors that affect pain may help patients to choose self-management strategies that are likely to be helpful leading to improved self-efficacy.

Beliefs, communication and understanding

Durham⁹ reported that three factors supported patients with TMD to engage in self-management; knowledge of their condition including precipitators and fluctuating course, confidence in the clinician treating them and their diagnosis and having been able to use self-management strategies to reduce or maintain a reduction in their pain.

In a clinical setting the first two factors speak about the importance of communication within the consultation. Good communication is a two-way process which involves the ability of the clinician not only to communicate information to the patient but also to make it clear that the clinician is listening carefully and actively considering the information that the patient is sharing with them. Strong communication skills will support clinicians to deliver appropriate information and to develop a relationship of trust with the patient. In turn these aspects of care will help clinicians to address beliefs and concerns the patient might have that would interfere with successful management.

Improved outcomes were achieved with a single session in which a clinical psychologist identified patient beliefs which were then addressed by a dentist in the first clinic appointment⁵¹. This illustrates the potential benefit of multidisciplinary staff working together. The surgeon need not carry the burden alone in addressing such complex but therapeutically pivotal changes in behaviour as self-efficacy.

Catastrophising

Catastrophising is a style of thinking that can be characterised as 'thinking the worst'. It is often associated with depressed or anxious mood and involves

a preoccupation and rumination about the worst possible outcome that could occur along with an inability to switch focus⁵². Catastrophising was first described in the context of anxiety and depression^{53,54} and has since been widely applied in pain management settings⁵². There is evidence of a link between catastrophising and pain outcome in persistent OFP. Miller and colleagues⁵⁵ reported strong correlations between catastrophising and high-impact pain in a sample of 846 adults with TMD in a community setting. Velly¹⁵ found that baseline catastrophising predicted both the onset and severity of clinically significant pain 18 months later.

Momentary pain has also been shown to be higher when linked with catastrophising within 3 h of pain measurement¹³. Two further studies^{14,56} using different experimental designs reported that changes in catastrophising were among several factors that mediated improvements in pain intensity following cognitive behavioural therapy for patients with TMD.

It is therefore well-established that the style of thinking known as catastrophising is an important factor that can contribute to the maintenance of high-impact symptoms of persistent OFP. While clinical psychologists, if available, have a range of methods to address catastrophising some simple steps can also be taken in the clinic. Table 1 outlines helpful advice and suggestions that can be shared with patients in clinic.

Psychological flexibility

Related constructs, which have been well researched in other pain management settings but have not, to our knowledge, been applied in the field of persistent OFP are psychological flexibility and its opposite, experiential avoidance. Psychological

Table 1 Information and recommendations about catastrophising that can be discussed with patients.

Information:

People who are in pain often end up thinking the worst. Although it is relatively normal to have thoughts like this, focusing on them can increase tension and make pain harder to deal with.

Recommendations:

It is useful to notice this kind of thinking when it appears and then to focus on something else.

Patients often find it helpful to make a list of routine or interesting activities that they can do to distract themselves from this kind of thinking.

Classes in mindfulness or yoga are often available in the community and can be very helpful in reducing this style of thinking over time.

flexibility⁵⁷ refers to the willingness and capacity of somebody to remain in contact with present-moment experience, even when this experience is unwanted. Experiential avoidance on the other hand refers to an unwillingness to remain connected to certain thoughts, feelings or physical sensations that are painful or uncomfortable⁵⁷.

A major challenge to persistent pain management is that initially patients are seeking a cure for their pain and believe that it is curable. Once ongoing disease states that may contribute to pain are addressed the clinical focus shifts from cure to management. At this stage there may be a discrepancy between the view of the patient, who is still expecting a cure and that of the clinician who realises that cure is now unlikely. At this stage patients need to shift their focus from searching for a resolution to their pain to using strategies that enable them to live a meaningful life even while pain is present.

A specific form of psychological treatment, Acceptance and Commitment Therapy (ACT), is based on an encompassing theory that attempts to avoid pain and other difficult internal experiences often have the unintended consequence of restricting engagement in activities that are personally meaningful and important⁵⁷. Such restriction is thought to be linked with poor outcome such as increased disability.

Research suggests that acceptance-based interventions can naturally reduce some of the factors such as catastrophising, depression and anxiety that are known to be risk factors for poor pain outcome⁵⁸. ACT, which aims to promote psychological flexibility and reduce experiential avoidance, has strong evidence in general pain management settings^{59,60}.

An important aspect of this approach which can be applied in routine clinical settings is a focus on prioritising things that are genuinely important and meaningful in life (known as values). Sometimes these values will be more important than the avoidance of pain and discomfort, and emphasis on values can help shift explanatory models of disease and illness for the patient. Patients can be encouraged and supported to focus on the experiences that they do want to have rather than thinking about experiences including pain that they want to avoid.

Future directions

A lot of progress has been made in the last 30 years in terms of incorporating biopsychosocial factors into our understanding of persistent pain, and this progress in understanding also applies to OFP. Applying these advances in an integrative manner to OFP

within routine primary and specialist treatment settings will likely improve the treatment of that type of pain.

Treatment models would benefit from incorporating a broader range of potentially relevant factors from the outset so that the staff delivering initial consultations routinely talk about the importance of psychological factors in ways that are socially inclusive and provide an accurate representation of the complexity of pain. This recommendation contrasts with the approach of focusing first on the medical aspects of OFP, and then presenting psychosocial models only when medical treatment fails; the implicit communication to the patient of this model of care provision, despite the increasing emphasis on alternative and complementary care models, is that their pain is somehow less real. The application of a more holistic and evidence-based model of treating persistent OFP could include an acknowledgement of the importance of providing patients the information that they need to understand their condition and initial management strategies (self-management) that they can start to instigate from the beginning.

For those with more disabling symptoms it could also include a fast track to more specialised care, such as the hub-and-spoke model suggested by Durham³² and in line with international guidelines³⁴. This might limit or prevent the iatrogenic effects of continued uncertainty and inappropriate management. A precedent for triaged care depending on targeted assessment measures that are even briefer than those discussed above has been successful in the related field of persistent back pain⁶¹.

In order to provide more integrated models of care it would also be useful for dental services to work more closely with multidisciplinary colleagues including clinical psychologists who can both provide training and support for the integration of psychological principles into routine care and provide individual therapy when required. This would be consistent with services which provide care to people with other forms of persistent pain.

Conclusion

In recent years important advances have been made in acknowledging that persistent OFP conditions are not purely medical and structural in nature but represent complex interrelationships between biological, psychological and social factors. Such conditions should therefore be treated within services which are able to acknowledge and respond appropriately to the people who are presenting for help. While

progress has been made, in many areas it is likely that further service development and training will be necessary in order to provide tailored care to people presenting to dental services with persistent orofacial pain.

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