

## Environmental Contributors to Back Pain

### 1. Disruptions to sleep may make the experience of back pain worse.

Sleep is increasingly deemed to be an essential component to general health and wellbeing. Growing evidence also suggests that sleep is not only affected by pain, but also influences pain. Poor sleep is a regular feature in chronic pain populations [35; 52], including back pain [4; 19; 22; 31], which is associated with increased pain severity [13; 42; 47], and animal studies have long shown that these sleep effects are mediated through inflammatory mechanisms [37]. Further, restricted or interrupted sleep enhances sensitivity to painful stimuli, impairs pain modulation and increase somatic symptoms in people with and without painful conditions [10; 24; 26; 48].

### 2. Poor quality sleep may increase the risk of back pain development.

Beyond just making back pain worse, some studies have shown poor sleep to be a risk factor for initial back pain development, the transition to chronicity and long-term progression [1; 25; 30; 53]. Luckily, the converse may also be true, with studies showing that improved sleep is associated with reductions in pain [8; 40], highlighting the need to further examine sleep interventions aimed at preventing and managing back pain [3].

### 3. Work-related factors can contribute to back pain persistence.

Various physical and psychosocial factors related to the work environment have been identified as risk factors for back pain and related disability [18; 29; 39; 45; 49]. In particular, physical factors like repetitive movements and jobs requiring very high physical effort have been associated with low back pain development [9; 20], while psychosocial factors like job dissatisfaction, job insecurity, long working hours, poor relationships with colleagues / employers, and poor work/life balance have all been associated with higher prevalence of back pain [49; 55].

### 4. Worker's compensation claims are often associated with greater disability and longer time to recover from back pain, but successful intervention is possible.

Unfortunately, the process of obtaining compensation for a work-related injury has historically been associated with worse pain, greater disability and reduced treatment efficacy[43]. This may be due to a need to demonstrate continued pain and disability for the purpose of the claim or may relate to other socioeconomic factors necessitating a compensation claim. Interventions aimed at facilitating return-to-work are, however, proving positive in populations with work-related musculoskeletal pain, suggesting that maintaining effective communication between stakeholders (including engaging the workplace as part of the treatment plan [32]), and providing early intervention based on risk classifications can lead to improved recovery and return to work success [34].

### 5. Positional variation may be more important in preventing or managing back pain than correcting "poor" posture

Although 'poor' posture has long been believed to cause back pain[36], there is no consensus on the causal relationship between different postures or specific physical tasks and pain [50]. Instead, it seems that just staying in the same position for long periods of time is associated with the development of at least transient back pain [7; 17]. As well, compared to asymptomatic controls, individuals with back pain tend to show less movement variability [11; 12] and have higher trunk muscle activity levels [28], suggesting a focus on maintaining the same 'correct' posture is likely misguided[38]. It may, thus, be more useful to focus on implementing more frequent breaks with variation in position during sedentary tasks [54] and addressing other related factors [33], rather than focusing on correcting 'poor posture'.

#### **6. Regular leisure time physical activity is helpful in preventing the development of back pain.**

Physical activity is one of the few factors consistently associated with lower incidence of back pain [2; 44], not to mention obvious beneficial effects on general physical and mental health. Even when back pain is present, continued physical activity also seems protective against the development of more severe symptoms and disability. Despite the overwhelming evidence for the benefits of exercise in preventing and managing back pain, the underlying mechanisms remain surprisingly unclear.

#### **7. Stressful life events make pain feel worse and may make it more difficult to cope with.**

It is well known from both experimental [16; 51] and clinical work that stress can have a strong effect on the pain experience. In the short-term, acute extreme stress may numb pain perception, but in the longer-term ongoing stress from work or social conflicts may contribute to pain exacerbation and persistence [41].

#### **8. Interactions with others (partners, colleagues, healthcare providers, employers, friends, family, etc.) can have a large impact on how back pain feels and progresses.**

Interpersonal communication can have immediate and ongoing effects on pain, with others having the capacity to make a person with back pain feel heard, informed and supported, or isolated, confused and invalidated. Most well studied are perhaps the effects of spousal relationships, showing that criticism or hostility in relationships, possibly related to poor understanding of the pain diagnosis, may lead to greater pain behaviour and disability [5; 6].

#### **9. Alcohol consumption and smoking may be associated with greater back pain prevalence.**

Although difficult to separate causation from correlation, there seems to be a greater prevalence of back pain in populations with high alcohol consumption and/or smoking history [23; 46; 56]. Alcohol consumption has also been associated with various measures of pain sensitivity among people with acute low back pain[24] though the relationships are complex and likely involve many bio-psycho-social factors[58]. The "alcohol-pain" relationship may also be bi-directional – greater pain may increase alcohol consumption, which may in turn increase pain [27; 58].

#### **10. Nutritional supplements are unlikely beneficial for people with low back pain.**

Various trials have investigated different dietary supplements, including vitamin D, glucosamine, probiotics, as well as herbal, homeopathic and other complementary interventions for back pain [14; 21; 57]. Supplementation rarely provides significant benefit, though some studies do report effects of herbal

compounds to reduce pain more than placebo [15]. Unfortunately, trial quality is often poor with varying control interventions and endpoints, so more high-quality research is needed to determine whether supplementation really is beneficial.

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