Cultural Differences in Chronic Pain: A Brief Review
Cultural Differences in Chronic Pain: A Brief Review

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ABSTRACT

Chronic pain experience is influenced by cultural beliefs and traditions among different groups. Risk factors for the development of chronic pain are consistent across cultures; however, there are vast differences in the perception, expression, coping, and management of pain. The aim of the present review was to compare cultural variations in chronic pain experience, pain management, and the relative effectiveness of opioid treatment in pain control among various cultures.

Methods: A literature search was conducted in PubMed, MEDLINE, EMBASE, and Google Scholar, using combinations of the following key words: “chronic pain,” “prevalence,” “culture,” “management,” and “developing countries.” The analysis of the literature focused on cultural differences in chronic pain experience, perception, and management. The studies that met the inclusion criteria were organized into separate groups for cultural variations in the experience of pain, chronic pain management, and opioid treatment.

Results: Various factors affect the human pain experience, including social norms and biological traits. Within the United States, African Americans and Hispanics have reported higher pain scores when compared to Whites and Asians. American Indians and Asians have stated the least pain complaints among all groups. Countries outside the U.S. have also reported differences in chronic pain across ethnic groups. Some cultures present highly expressive pain experiences, while others exhibit stoicism. Chronic pain patients in most of the world rely on NSAIDs, massage therapy, physical therapy, and traditional medicine for treatment. In the United States, opioids are the main treatment for chronic pain, although their use has not shown more effectiveness in controlling pain symptoms than other types of analgesics or non-pharmacological therapy.

Conclusion: The impact of culture in pain experience is displayed by a variety of patient attitudes, behaviors, beliefs, and coping mechanisms. Pain management approaches are likely based on cultural beliefs about health that influence expectations regarding treatment outcomes. Opioid pain management, despite its rampant use in the developed regions of the world, has not been proven to be a superior alternative, except in countries that commonly use traditional medicine and turn to opioids only when all other pain treatments have failed.

INTRODUCTION

Pain is a universally unpleasant experience comprised of emotional and sensory components that can be triggered by tissue damage, and may persist after healing.1 Generally speaking, when pain manifests for 6 months or longer, and has been experienced within the last month, that pain is considered chronic.2 Despite global variation in cultural characteristics and development level, several risk factors have consistently been associated with the development of chronic pain: female gender, older age, lack of education, lower socioeconomic status, employment status, and obesity.2-5

Multiple studies have reported that the
expression of pain varies widely among cultures.\textsuperscript{6-8} The differences in pain experience can be explained by the biopsychosocial model of pain, which includes sociocultural influences.\textsuperscript{8,9} Culture plays an important role in pain perception, behavioral expression, and coping mechanisms, since they are acquired patterns that members of a community learn from one another.\textsuperscript{6} The actions that individuals take to deal with pain vary among countries, and these measures have resulted in a variety of culturally specific issues, including pain under management and narcotic dependence.

\section*{MATERIALS AND METHODS}

The published articles examined focused on cultural differences in chronic pain experience, and how this may lead to disparities in chronic pain management around the world. A literature search was conducted in PubMed, MEDLINE, EMBASE, and Google Scholar, using various combinations of the terms "chronic pain," "culture," "developing countries," "race," "ethnicity," "racial differences," "comparison," "prevalence," "management," and "opiod." Additional articles were obtained from references in the relevant literature. This review included recent studies published during 2005-2017. Examination of abstracts determined potential eligibility, and the full articles were obtained on studies that met the inclusion criteria. The literature included consisted of published studies on adult populations from developed and developing countries, with a focus on cultural influences on pain and chronic pain management, and comparative analyses between samples of different ethnic backgrounds. As the use of opioids varied among developed countries, we only included countries mentioned in the previous sections. The articles that met the inclusion criteria were organized into the following categories: cultural differences in chronic pain, chronic pain management, and differences in opioid use between countries.

Articles were excluded if: a) their target population was pediatric; b) focused only on cancer pain; c) the article was a case report or case series; or d) an English translation of the article was not available.

\section*{RESULTS}

A search for literature on cultural variations in chronic pain within a single country yielded 6 relevant studies conducted in the U.S., and 4 studies outside the U.S. Table 1 contains a summary of each. These studies classified various cultures by race/ethnicity. Table 2 summarizes five comparative studies on pain experience between countries. Examination of pain management and opioid use across countries yielded pertinent information about the U.S. and several Asian and European countries. Non-opioid treatments to chronic pain are described and summarized in Table 3, and opioid use in Table 4. A limited number of studies on chronic pain from Africa and Latin America were available, but these did not assess cultural characteristics of pain, and thus they were excluded. Numerous studies used to obtain background information were not summarized in the tables.

\textbf{Cultural Variations in Chronic Pain Within a Single Country}

Individuals are strongly influenced by cultural factors when they experience pain, and pain experience may be different from one region to another within a single country.\textsuperscript{6} The population of the United States varies widely in race and ethnicity, and pain experience differs between and among population subsets.

Experimental studies have demonstrated differences in the sensory perception of pain stimuli among different ethnic/racial groups, and these studies suggested that pain tolerance is highly influenced by cultural factors.\textsuperscript{7} Research on healthy subjects has generally indicated that African Americans, Hispanics, and Asians have lower pain tolerance than Whites (higher pain
sensitivity), while Native Americans have higher pain tolerance (lower pain sensitivity) than Whites.\textsuperscript{10–13} When comparing measures of perceived pain among chronic pain patients, no differences were found among African Americans, Hispanics and Whites.\textsuperscript{14} Between Asians and Whites, differences were seen only in female subjects, with White females presenting lower pain intensity scores than Asian females.\textsuperscript{15} Similar findings have been reported by literary analysis on race, ethnicity and pain.\textsuperscript{7–9}

In addition to sensory perception, differences in response to pain have been observed across ethnic groups.\textsuperscript{14} The lack of control over pain has been reported as one of the most distressing aspects of the chronic pain experience, leading to negative emotional responses such as pain hypervigilance, pain catastrophizing, greater pain severity, depression, and disability.\textsuperscript{8} Such responses are more frequently observed in African Americans.\textsuperscript{11,14} Religion has been observed to influence pain coping mechanisms used by patients. For example, African Americans and Hispanics have often reported the use of prayer, while Asians have often reported using mind-over-body strategies.\textsuperscript{8,14} African Americans, Hispanics, and Whites have been found to be more accepting of pain expression.\textsuperscript{8,11,14} Asians and Native Americans have been observed to exhibit more stoic pain behavior, and may not show distress due to cultural expectations which frown upon behavioral expression of pain.\textsuperscript{8,13}

Ethnic differences in pain experience have also been reported outside the U.S. A cross-sectional study of Singaporean adults, made up of three major racial groups (Chinese 73.8\%, Malay 12.8\%, and Indian 9.7\%), revealed that Indians had the highest prevalence of chronic pain, while Malays had the lowest.\textsuperscript{16} The study suggested that genetics and cultural factors may influence pain reporting and prevalence of chronic pain conditions.

Arabic-speaking Gulf countries have experienced population growth among minority groups due to an influx of migrants seeking employment. A study showed that non-Kuwaitis living in Kuwait had a lower prevalence of disability due to chronic pain conditions, while Kuwaiti nationals often presented pain-related health problems, including osteoarthritis, obesity, diabetes, etc.\textsuperscript{5} Similarly, in Saudi Arabia, Indian continental immigrants reported lower BMI scores and lower prevalence of low back pain compared to Saudi nationals.\textsuperscript{17} Both studies concluded that differences observed between immigrants and nationals may be explained by several factors common to Gulf state nationals, including: a sedentary lifestyle; customary social gatherings which center around food, lack of exercise, especially among females; and the use of loose-fitting clothing that hinders body weight awareness and social pressure to lose weight.\textsuperscript{5,17} It is likely that immigrants have more active lifestyles because they do their own housecleaning, gardening, and walking errands. Kuwaitis and Saudis, by contrast, often employ people to do those chores for them.

The United Kingdom, which is also experiencing expanding ethnic diversity, exhibits differences in chronic pain among its population subsets. When compared to Blacks and Asians, Whites have reported a lower prevalence of chronic pain, higher prevalence of depression, and higher comorbidity of chronic pain and depression; however, Blacks and Asians have reported more pain sites, a stronger correlation of chronic pain and depression, and higher mean depressive symptom scores than their White counterparts.\textsuperscript{18} The study also suggested that minority ethnic groups may be more likely to visit a medical provider for physical symptoms than for depression.

\textbf{Cultural Variations Between Different Countries}

Cultural variations are noticeable when comparing chronic pain reports between
different countries. It is not surprising then that in experimental studies on pain, variability exists in pain perception when participants from different countries are exposed to the same pain stimulus. A study on experimental pain response on patients with temporal-mandibular disorder revealed that all subjects experienced the same pain intensity; however, Italian patients reported the highest sensitivity to mechanical and electrical stimulation, while Swedish patients reported the lowest sensitivity. A similar investigation of healthy subjects undergoing oro-facial somatosensory stimuli reported that Chinese participants were more sensitive to thermal and pressure pain than Danish participants. These findings are supported by early studies that observed higher pain tolerance in Whites than Asians, and higher pain tolerance in patients of northern European descent than those of Mediterranean descent.

A comparative study between chronic pain patients from Singapore and the United States observed that in the U.S., subjects reported higher levels of depressive symptoms, disability, and safety seeking behaviors, such as guarding, resting, and asking for assistance. Singaporean patients, by contrast, viewed themselves as less disabled by pain. Singaporeans were more likely to believe that their chronic pain had a cure, and that medications were the appropriate course of treatment for their pain. Asians have been observed to be less accepting of pain behavior, and had lower levels of depression and disability, most likely due to their perception of internal control over pain. A similar study on patients from Portugal and the United States revealed that the U.S. sample presented less depressive symptoms, lower measures of pain when maintaining physical activity, and more often used guarding and resting as a coping response, while Portuguese subjects were more prone to disability, depression, and seeking social support. This study suggested that two cultural characteristics of the Portuguese sample may distinguish it from the U.S. sample: 1) A tendency to exhibit melancholic and depressive attitudes in stressful situations; and 2) The cultural premium placed on interpersonal relationships in Portuguese society.

Cross-cultural differences in the description of pain have been found between patients from the US and Nepal. In the US, patients often used single-words to describe pain, such as “sharp,” “throbbing,” and “dull,” while in Nepal, patients use metaphors, such as “like an infection” or “like an ant bite.” Others compared their pain to past experiences, and often mentioned their beliefs about the cause of their pain. One-word descriptors were used by Nepalese patients; however, these lacked equivalent single-word translations in English. Some of the descriptors meant “achy pain often made worse by cold” and “sensation of swelling and/or inflammation.” This study highlighted the importance of cultural factors in the translation of pain quality measures to maintain validity when used in non-English speaking populations. Another cross-cultural validated survey used in India and Nepal revealed higher chronic pain prevalence in Nepal, and higher pain scores in India. Harsh living and working conditions and greater stoicism among Nepalese have been observed in early studies, and might explain these differences between India and Nepal.

Pain Management across Cultures
Cultures have different beliefs that influence the way individuals manage chronic pain. While many countries rely only on modern western medicine, others use ancient methods which are embedded within their culture. Many traditional health therapies use methods believed to re-establish harmony and equilibrium within the body by the use of herbal medicines, manual techniques, exercises, and spiritual practices.

In Singapore, chronic pain is most commonly treated with NSAIDs; however, complementary and alternative medicine
(CAM) is also used by 84% of patients. Chinese, Malay, and Indian ethnic groups in Singapore most commonly use Traditional Chinese Medicine, including manual techniques, such as acupuncture and Tui Na, movement therapies like Tai Chi and Qi Gong, and Chinese herbs. Indian Ayurvedic medicine and traditional Malay medicine were also reported, although less frequently. Similarly, other South East Asian nations have also reported the use of CAM. Traditional Thai medicine involves massage and medicinal herbs, which are packed in a ball shape to be boiled or steamed, and then pressed onto the skin. Most patients in Thailand use massage treatments for pain management. In Myanmar, most chronic pain patients do not seek medical help; instead, they use meditation/relaxation techniques, which have been reported to cause sufficient pain control in all patients.

Medical care in Japan combines modern Western medicine with traditional Kampo medicine. Over-the-counter NSAIDs are the most common form of pain management; however, most physicians also use Kampo medicines, made of spray-dried granular herbal extracts. Other common pain therapies include traditional massage (Shiatsu), physical therapy, and acupuncture.

Traditional Indian Medicine, called Ayurveda, is used primarily in Nepal and India. It includes a variety of therapies, such as nutrition, yoga, exercise, herbal medicines, ointments, massage therapy, and surgical techniques (incision, excision, drainage, suturing, etc.). Nepalis more often reported the use of traditional medicine, and were more likely to seek pain management from non-physician sources, such as traditional healers. Medical services in India are paid for by the government, while in Nepal, they are paid for by the patient, which may explain the different approaches to pain management.

An increased use of complementary and alternative medicine, especially acupuncture, has been reported in developed countries, such as Sweden, Denmark, Italy, the U.K., and the U.S. In contrast to traditional Chinese acupuncture, which is believed to improve the flow of the qi, Western acupuncture involves brief needling on small areas of strained or injured muscle which stimulates the nervous system to control the perception of pain by the release of endorphins. There is also evidence that physical and massage therapies, which are the most common complementary therapies to conventional medicine, have demonstrated efficacy in treating numerous chronic pain conditions.

Opioid Use and its Effectiveness in Pain Control
Developed countries, like the US and the UK, consume most of the world’s opioid supply, while in developing countries, opioid availability is limited by financial resources and national regulations.

In Singapore, one study reported that 3% of chronic pain patients received strong opioids for at least three months. The study noted several key findings. First, improved function was demonstrated in 61.9% of the patients. Second, of those patients who were unemployed when their opioid treatment began, 23.8% were later able to return to work. Third, 11.6% of this group ultimately demonstrated aberrancy. In a similar study out of Japan, physicians reported that strong opioids showed clinical effectiveness in 77.3% of patients, opioid therapeutic goals were reached in 64.5% of patients, and 0.6% of patients experienced drug dependence. In both studies, strong opioids were used on patients that were not responsive to other treatments. It should be noted that Japan and Singapore were the only countries in the reviewed literature that showed positive results in the treatment of chronic pain with opioid analgesics.

In some European countries, such as Italy and Portugal, opioid consumption for chronic pain management has been reported to be...
CULTURAL DIFFERENCES IN CHRONIC PAIN

<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>Sample</th>
<th>Study design</th>
<th>Pertinent Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rahim-Williams FB et al. (2007)[10]</td>
<td>United States</td>
<td>N=206 AA=63 Latin=61 NIH=82</td>
<td>Experimental</td>
<td>Heat and cold pain tolerance, and pain sensitivity range (PSR) were lower in African Americans and Hispanics compared to NIH (p&lt;0.05). No group differences were seen in any pain threshold measures and ischemic pain tolerance.</td>
</tr>
<tr>
<td>Campbell CM et al. (2005) [11]</td>
<td>United States</td>
<td>N=120 AA=62 NIH=58</td>
<td>Experimental</td>
<td>African Americans presented lower tolerance in all types of pain than NIH (p&lt;.05). African Americans presented higher intensity and unpleasantness of heat pain, paresthesia crossing scores and level of reactivity (hypersensitivity) than NIH (p&lt;.05). No group differences were seen in pain threshold measures.</td>
</tr>
<tr>
<td>Rowell et al (2011)[12]</td>
<td>United States</td>
<td>N=60 Asian=30 NIH=30</td>
<td>Experimental</td>
<td>Asians were more sensitive to cold pressor pain (both pain threshold and pain tolerance) than NIH (p&lt;.05). Asians reported higher ratings of unpleasantness, and showed both reduced pain tolerance and reduced pain threshold relative to NIH (p=0.05). Pain intensity ratings were similar in both groups.</td>
</tr>
<tr>
<td>Pain S et al. (2013)[13]</td>
<td>United States</td>
<td>N=26 Native American=22 NIH=20</td>
<td>Experimental</td>
<td>NIHs reported higher pain sensitivity than Native Americans. Native Americans had higher ischemic pain tolerance, reported lower pain ratings during temporal summation, and rated the stimulus less painful than NIHs (p&lt;0.01).</td>
</tr>
<tr>
<td>Edwards R et al. (2005) [14]</td>
<td>United States</td>
<td>N=100 Asian=50 NIH=50</td>
<td>Survey</td>
<td>African Americans and Hispanics are more likely to use pain coping strategies like praying and hoping (p&lt;0.001). Commonplace was associated with greater pain severity in both groups, AA and NIH (p&lt;0.05). Prayer/hoping was associated with greater disability in all ethnic groups (p&lt;0.05).</td>
</tr>
<tr>
<td>Ahn H. et al. (2017)[15]</td>
<td>United States</td>
<td>N=100 Asian=50 NIH=50</td>
<td>Experimental</td>
<td>Asian Americans had higher levels of clinical pain intensity, higher experimental pain sensitivity, and higher levels of disability than NIH. NIH had higher pain threshold and tolerance than Asian. (p&lt;.001). Pain intensity and interference scores were lower in NIH females than Asian females (p&lt;0.001).</td>
</tr>
<tr>
<td>Yeo SN and Tay KH (2009) [16]</td>
<td>Singapore</td>
<td>N=4141 Chinese=2056 Malay=530 Indian=402 Other=133</td>
<td>Cross-sectional</td>
<td>The prevalence of chronic pain was 8.7% (p=0.29). Singapore has 3 major racial groups and the prevalence of chronic pain varied among these groups: Chinese (8.7%), Malay (6.4%), Indian (11%), and other groups (9.2%).</td>
</tr>
<tr>
<td>Denny MC et al. (2015)[5]</td>
<td>Kuwait</td>
<td>N=2103 Kuwaiti=1434 Non-Kuwaiti=645</td>
<td>Cross-sectional</td>
<td>Pain longer than 3 months (p&lt;0.05), and chronic conditions such as hypertension, osteoarthritis, diabetes (P=0.001) were most frequently seen in Kuwaitis nationals than immigrants. Kuwaiti women reported higher pain intensity, greater number of pain sites, longer duration of pain, when compared to non-Kuwaitis females (P=0.001).</td>
</tr>
<tr>
<td>Behai M. et al. (2015)[17]</td>
<td>Saudi Arabia</td>
<td>N=964 Saudi=293 Indian=144 Other Arab=142 Other non-Arab=340</td>
<td>Retrospective</td>
<td>Participants reporting back pain last year: Indian Sub (47%), Other Arabic (62%), Other Non-Arabic (60%), Saudi (70%), SE Asian (60%). P=0.005. Odds ratio for the presence of back pain: Saudi nationality (2.3), Indian Sub (2.7), BMI (overweight: Saudi (66%), Indian (55%).</td>
</tr>
<tr>
<td>Nicholl BJ et al. (2015)[18]</td>
<td>United Kingdom</td>
<td>N=148,139 White=135,703 Black=3897 Asian=4530</td>
<td>Cross-sectional</td>
<td>Depression was more commonly seen in Whites, compared to Blacks and Asians (22.1%, 12.9%, and 13.8%, respectively). Whites reported depression without pain more frequently, while chronic pain without depression was more common on Asians and Blacks than Whites (38.4%, 36.6%, and 29.4%). P=.001 for all variables.</td>
</tr>
</tbody>
</table>

Table 1. Cultural Variations in Chronic Pain within a Country. AA = African American, NIH = Non-Hispanic White

relatively low.31,33,36 By contrast, the UK and Denmark have reported high levels of narcotic consumption.2,29,30,33 Interestingly, opioid therapy outcomes have not been generally positive. Indeed, patients taking opioids have reported higher disability rates and worse mental health when compared to patients taking non-opioid analgesics.29,36

In the United States, chronic pain affects about 26% of the adult population.37 About one third of chronic pain patients have reported the use of prescription medication, and opioids have been the most common pharmacotherapy.37 Opioid prescription rates have significantly changed, making them more available for long-term therapy for chronic non-cancer pain.38 Between 1999 and 2010, opioid prescription and opioid-related overdose deaths increased significantly, and despite decreased prescription rates from 2010 to 2015, the total amount of opioids prescribed remained about three times as high in 2015 as in 1999.38 Notwithstanding aggressive approaches to chronic pain treatment, about half of all opioid users have reported persistent and severe pain.37

These studies curiously suggest that countries with high consumption of opioids for chronic pain do not report better pain management results when compared to countries with low opioid consumption. This is especially true in the U.S. which has the highest rates of both opioid consumption and inadequate pain control. This fact begs the question of whether chronic pain patients are truly benefitting from opioid pharmacists.
Table 2. Cultural Differences in Chronic Pain Between Countries.

<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>Sample</th>
<th>Study design</th>
<th>Pertinent Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Al-Herby M et al. (2016) [19]</td>
<td>Saudi Arabia, Sweden and Italy</td>
<td>N=122</td>
<td>Experimental</td>
<td>Italians reported significantly lower electrical pain tolerance than other cultures (P = 0.01). Italian females reported the highest sensitivity to both electrical and mechanical stimulation, while Swedes reported the lowest sensitivity (p=0.05). Characteristic pain intensity differences were non-significant among groups.</td>
</tr>
<tr>
<td>Yang G. et al. (2013) [20]</td>
<td>China and Denmark</td>
<td>N= 58 Chinese= 29 Danish= 29</td>
<td>Experimental</td>
<td>The Chinese participants showed higher sensitivity than Danes with regard to cold detection threshold (P = 0.005), warmth detection threshold (P=0.002), thermal sensory linear, cold pain threshold (P=0.003), mechanical pain sensitivity (P=0.003) and pressure pain threshold (P=0.001).</td>
</tr>
<tr>
<td>Thong I. et al (2016) [21]</td>
<td>Singapore and the US.</td>
<td>Singapore=100 US=106</td>
<td>Cross-sectional</td>
<td>U.S. sample more often reported use guaishou, resting, asking for assistance to cope with pain, and see pain more disabling than the Singapore sample (p=0.01). Singapore patients have a stronger belief that pain is a sign of harm, medications are appropriate treatment, and a medical cure exists for their pain condition (p=0.01).</td>
</tr>
<tr>
<td>Ferreira-Valente M et al. (2011) [22]</td>
<td>Portugal and the US.</td>
<td>Portuguese=117 US sample= 141</td>
<td>Cross-sectional</td>
<td>Pain persistence was negatively associated with measures of pain and depression in the U.S. sample. Portuguese sample showed positive association between pain interference and working social support, paying was negatively associated with depression.</td>
</tr>
<tr>
<td>Sharma S. et al. (2016) [23]</td>
<td>Nepal and the US.</td>
<td>Nepal= 101 US sample= 302 US sample= 213</td>
<td>Survey</td>
<td>Patients from Nepal often used metaphors to compare their pain, which was uncommon in US patients. Non-specific used words such as piercing, heavy, and stretching to describe pain, while US sample used words like sharp, throbbing, and dull.</td>
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</table>

Table 3. Pain Management across Cultures.

<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>Sample</th>
<th>Study design</th>
<th>Pertinent Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tan M. et al. (2013) [26]</td>
<td>Singapore</td>
<td>N=210 Chinese= 180 Malay= 19 Indian= 19 Other= 4</td>
<td>Cross-sectional</td>
<td>The most common CAM methods used are acupuncture (49%), Tui Na (17%) and massage (16%), Chinese herbs (18.1%), and Tai Chi/ Qi Gong (3.3%), which are part of traditional Chinese medicine. Ayurvedic/yoga was used by 1.9%, and Hams/Malay bhasha by 0.5%. CAM was used in 84% of patients, and was helpful in 72% of patients.</td>
</tr>
<tr>
<td>Sakkibera T. et al. (2013) [27]</td>
<td>Japan, Thailand, and Myanmar</td>
<td>Japan=1000 Thailand= 446 Myanmar= 405</td>
<td>Cross-sectional</td>
<td>The most common pain management strategies used other than consulting a physician were: Japan: over-the-counter medications, manual/physical manipulation, and rehabilitation. Thai: massage, rehabilitation and manipulation/relaxation therapy. Myanmar: meditation/relaxation therapy and massage.</td>
</tr>
<tr>
<td>Walter J. et al. (2017) [24]</td>
<td>India and Nepal</td>
<td>Nepal= 94 India= 84</td>
<td>Cross-sectional</td>
<td>Chronic pain prevalence: India 24%-41%, Nepal 48%-50%. Pain scores (0 to 10): India 5.2, Nepal 2.8. In India, 100% of patients reported seeking pain management from a physician, versus 82% in Nepal (p=0.019). Most patients from India and Nepal reported taking pills for pain relief. In addition, Nepal also reported more frequent use of yoga, herbal therapy and acupuncture.</td>
</tr>
<tr>
<td>Bejrk H. et al. (2006) [2]</td>
<td>Europe</td>
<td>N=4839 (~300 per country)</td>
<td>Observational</td>
<td>Most frequent non-drug pain treatments used: Denmark: physical therapy (27%), massage (21%) and acupuncture (27%). Sweden: physical therapy (35%), acupuncture (41%) and massage (36%).</td>
</tr>
<tr>
<td>Harker J. et al. (2012) [29]</td>
<td>Sweden and Denmark</td>
<td>N/A</td>
<td>Literature review</td>
<td>The majority of patients attempted to pain control with self-medication (68.6%), and undertreatment of the problem (32.6%). Treatments received at the pain center included non-opioid analgesics (15.3%), psychological therapy (23.3%), and psychological support (7%). Alternative medicine, especially acupuncture, was used by 52.6% of patients.</td>
</tr>
<tr>
<td>Lozter C. et al. (2017) [31]</td>
<td>Italy</td>
<td>N=129</td>
<td>Descriptive</td>
<td>Non-drug interventions: (photosynthesis (40%), exercises (5%), acupuncture (5%), transcutaneous electrical nerve stimulation (5%), and other (psychotherapy, occupational therapy, osteopathy, and heat pack).</td>
</tr>
<tr>
<td>Nahin R. et al. (2016) [32]</td>
<td>United States</td>
<td>N/A</td>
<td>Literature review</td>
<td>Complementary strategies used for pain management has shown evidence for efficacy and safety in acupuncture and yoga for back pain, acupuncture and Tai Chi for knee pain, massage therapy for neck pain, and relaxation therapy for headache.</td>
</tr>
</tbody>
</table>

Table 4. Opioid Use and its Effectiveness.

<table>
<thead>
<tr>
<th>Study</th>
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<th>Study design</th>
<th>Pertinent Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>George J. et al (2013) [34]</td>
<td>Singapore</td>
<td>N= 1389</td>
<td>Retrospective</td>
<td>The use of strong opioids in chronic non-cancer pain was 3%. Improvement in daily activity function was seen in 35.7%, and patients previously unemployed (23.8%) who were able to work while on opioid therapy. 61.8% of patients with chronic non-cancer pain on active opioid treatment were able to function without becoming an economic burden. Abstinence was seen in 11.5% of patients on opioids.</td>
</tr>
<tr>
<td>Kawai K. et al (2017) [35]</td>
<td>Japan</td>
<td>N=499</td>
<td>Observational</td>
<td>Strong opioids were used in patients with moderate to severe chronic non cancer pain who did not respond to other analgesics. Clinical effectiveness was seen in 77.3% of patients. Therapeutic goal was achieved in 64.5% of patients. Drug dependence was reported in 3 patients (59%).</td>
</tr>
<tr>
<td>Bejrk H. et al. (2006) [2]</td>
<td>Europe</td>
<td>N=4839 (~300 per country)</td>
<td>Observational</td>
<td>Opioid consumption: US (40%), Sweden (35%), Denmark (33%), and the UK (11%). Weak opioid consumption: Denmark (9%), Italy (9%), Sweden (56%), the UK (39%), inadequate pain control from medication: Sweden (30%), Italy (33%), the UK (48%), and Denmark (74%).</td>
</tr>
<tr>
<td>Hart O. et al (2015) [30]</td>
<td>United Kingdom</td>
<td>N= 264</td>
<td>Retrospective</td>
<td>Weak opioids were prescribed to 61% of patients. Compounded analogues were prescribed to 73% of patients. At least one strong opioid was prescribed to 17% of patients. Most patients (96%) received an opioid containing analgesics within the three-year study period. NSAIDs and opioids are the mainstay of chronic pain management.</td>
</tr>
<tr>
<td>Harker J. et al (2012) [29]</td>
<td>Sweden and Denmark</td>
<td>N/A</td>
<td>Literature review</td>
<td>Chronic Pain patients taking medication for pain= 76%. Paracetamol was the most commonly used drug (21%), followed by NSAIDs. Opioid use: 4.37% (Weak opioids 4.29%, Strong opioids 0.17%). No difference in treatment satisfaction between opioid and non-opioid groups. Opioid users had continuous Chronic Pain significantly more often, and higher pain intensities, higher pain-related disability, and higher levels of depression and anxiety symptoms: P&lt; 0.05 for all variables.</td>
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<tr>
<td>Azevedo L. et al (2013) [36]</td>
<td>Portugal</td>
<td>N=5004</td>
<td>Cross-sectional</td>
<td>Chronic Pain patients taking medication for pain= 76%. Paracetamol was the most commonly used drug (21%), followed by NSAIDs. Opioid use: 4.37% (Weak opioids 4.29%, Strong opioids 0.17%). No difference in treatment satisfaction between opioid and non-opioid groups. Opioid users had continuous Chronic Pain significantly more often, and higher pain intensities, higher pain-related disability, and higher levels of depression and anxiety symptoms: P&lt; 0.05 for all variables.</td>
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<tr>
<td>Tabin, R et al (2011) [37]</td>
<td>United States</td>
<td>N=4900</td>
<td>Cross-sectional</td>
<td>Chronic pain was reported by 26.3%. A third of people with chronic pain reported current use of a prescription medication to treat their pain. Of those, 45.7% took opioid analogues. Among opioid users, 20.5% reported mild pain, 30.7% reported moderate pain, and 48.8% reported severe pain. Opioids are the mainstay treatment for chronic pain.</td>
</tr>
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DISCUSSION

Our review revealed a variety of results across studies in pain experience and culture. Most investigations in the U.S. assessed cultural differences based on racial/ethnic background. When compared to Whites, emotional and behavioral responses to pain were frequently reported to be more noticeable in African Americans and Hispanics, while Asians and Native Americans were more likely to exhibit stoicism.\textsuperscript{8,11,13,14} In some experimental studies using multiple pain stimuli, African Americans, Hispanics, and Asians reported lower pain tolerance than Whites, while Native Americans reported higher pain tolerance.\textsuperscript{10–13,15} It was suggested that pain sensitivity testing may predict risk for development of chronic pain, but the underlying mechanism is not well understood.\textsuperscript{3,9,13} Likewise, when comparing pain responses between countries, certain principles showed consistency. For example, Asian subjects reported more stoicism and less pain impairment, while southern European subjects reported more emotional pain response and pursuit of social support, when compared to other groups.\textsuperscript{19,21,22}

Pain coping strategies depend on a patient’s beliefs about health and cultural acceptance of treatments. For example, some cultures believe that health is a balanced state of energy. In these cultures, chronic pain symptoms are caused by a lack of energy balance, which can be treated with traditional medicine.\textsuperscript{24–28} In Western countries, chronic pain is mostly treated with NSAIDs, paracetamol or opioids.\textsuperscript{2,29–31,36–38} The use of opioids has increased exponentially in the U.S. and some European countries, but there is not consistent evidence of their effectiveness for the treatment of chronic pain.\textsuperscript{29,33,38} Positive outcomes with opioid use were reported in studies that focused on improvement of functional status, activities of daily living, and stress management, but were not reported in the context of pain intensity or pain scores.\textsuperscript{34,35} These results were found only in Singapore and Japan, two developed countries that used opioids in conjunction with traditional medicine.\textsuperscript{34,35} Traditional medicine has been found to produce a beneficial impact on the emotional and physical components of pain. Perhaps the increased use of traditional medicine in Western countries is due to the complexity of chronic pain management, and to the fact that traditional techniques have been found to improve function, to assist with pain coping, and to reduce distress and disability.\textsuperscript{2,29,30}

Our review was limited by several factors, the most restrictive of which was the insufficient number of studies conducted outside the U.S., especially in Africa and Latin America. The available studies were conducted using varying methodologies. As a result, some of the findings were inconsistent, most notably those involving experimental pain sensitivity among Asians and Whites. Many studies used race/ethnicity as a marker of culture, but there may be potential confounding factors associated with cultural pain response, such as occupation, education, lifestyle, acculturation/assimilation, and race/ethnicity of the examiner. These factors were not accounted for in some of the selected studies. Similar reviews on ethnicity and pain have revealed heterogeneity in outcomes, which has been attributed to the use of different pain modalities tested and multiple statistical tests.\textsuperscript{7,9} The selected studies had varying degrees of bias, such as recall bias on studies that relied on participants’ self-report, and nonresponse bias on telephone/internet surveys with low response rates. Some studies had very small samples, which diminish the significance of the findings. One of the strengths of our review is that we included both developed and developing countries to demonstrate cultural variation not only in terms of race, but also in terms of socioeconomic status and geographic location. To optimize our results, we compared our retrievals with other reviews and identified the
most pertinent literature.

Cross-cultural investigations have focused on race/ethnicity as the main determinant for culture classification, but it is not exactly clear how race and ethnicity influence the experience of pain. Some studies suggested the differences among ethnic/racial groups may be due to genetic variations in pain sensitivity. However, another study stated that cross-cultural studies should not be delineated only by race, but also by standards of behavior and shared sense of identity. More recent reports argue that focusing only on race is problematic because race is a poor marker of genetic diversity. These studies generally contend that other variables, including geographic ancestry, socioeconomic status, and language generate more accurate results in health condition analysis. Describing study results in terms of race may not be reliable because genetic variations are not definite among races. Perhaps in the future, with the increased use of genome sequencing, studies that classify samples by race/ethnicity may lose validity. Future results may become more reliable with the development of standardized pain research, and a more comprehensive classification of culture. Ideally, such research would then lead to the creation of practices and policies to improve the quality of pain assessment and pain management. In the United States, a nation-wide political policy change in pain management is in order. An improvement in pain management methodology might serve to alleviate current financial stresses on the healthcare industry by helping to reduce or eliminate ineffective pain treatment methods.

REFERENCES


