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Abu-Saad Huijer H. Chronic pain in children and adolescents :  
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**ABSTRACT : Chronic pain in children has been increasing in prevalence and studies have provided evidence that it impacts the functional/physical aspects of the children's life and their psychological and emotional well-being. Family caregivers of children and adolescents with chronic pain suffer a great sense of burden affecting their emotional, social, and family functioning. The problem is also exacerbated by the additional financial burden secondary to increased physician consultation and medication use.**

**A better understanding of pain in children is needed in order to gain insight in the etiology. The aim of the following article is to provide a review of the literature on the prevalence of chronic pain in children and adolescents and the factors associated with it.**

#### INTRODUCTION

In Lebanon, the prevalence of chronic pain has never been studied in children and adolescents. In view of the current barriers to effective pain management as reported by Abu-Saad Huijer & Daher [1] and Daher et al. [2] and the fact that the Lebanese people have suffered the pain and turmoil of war for a period of 30 years, it becomes increasingly important to highlight the problem of chronic pain and to understand its correlates in children.

There is an extensive knowledge on the epidemiology of chronic pain in adults, however little was known about chronic pain in children and adolescents until recently. Chronic pain has been increasing in prevalence and there is strong evidence that it has detrimental effects on physical and mental health, daily activities, family relationships, and economic well-being of children and their families. Chronic pain impacts the functional and/or physical aspects of the children's life and their psychological and emotional well-being [3-7]. Family caregivers of children and adolescents with chronic pain suffer a great sense of burden affecting their emotional, social, and family functioning [8-9]. The problem is also exacerbated by the additional financial burden secondary

to increased physician consultation and medication use [10-11].

A better understanding of pain in children is needed to gain insight in the etiology of pain in children. The aim of the following article is to provide a review of the literature on the prevalence of chronic pain in children and adolescents and the factors associated with it, in order to understand the magnitude of the problem and to depict strategies for the prevention and management of chronic pain in Lebanon.

#### DEFINITION OF CHRONIC PAIN

The International Association for the Study of Pain (IASP) defines pain as "*an unpleasant sensory or emotional experience associated with actual or potential tissue damage, or described in terms of such damage*" [12]. Chronic pain is referred to as pain or discomfort that has persisted continuously or intermittently for longer than three months (IASP, 1986). Most studies reviewed in children defined chronic pain similarly as a recurrent pain lasting for at least three months [5, 7, 13-16].

#### PREVALENCE OF CHRONIC PAIN

Little is known about the epidemiology of pain in children ; prevalence studies on chronic pain in children are very few. However, research on specific pain conditions indicated that there are a variety of chronic pain conditions in childhood.

Perquin and colleagues [14] studied the prevalence of pain in general in Dutch children aged 0 to 18 years ; of all respondents, 25% reported chronic pain. A survey of 679 schoolchildren aged 11 to 14 years revealed that 28.2% complained of neck and back pain, and 8.4% experienced widespread pain [17]. Another study conducted by surveying 495 schoolchildren aged 9 to 13 years, reported that 6% had definite or possible chronic pain which was defined as lasting few months or greater [18]. In this survey, recurrent headaches, growing pains, stomach pains, and muscle pains were reported respectively by 32%, 21%, 19%, and 2% of the study population.

In a population-based study in 67 primary and secondary schools in the UK, 2165 children were surveyed regarding migraines and other types of headaches ; the

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estimated prevalence rates of migraine and tension headache were 10.6% and 0.9% respectively [19]. However another study conducted in Poland reported that secondary schoolchildren had higher prevalence of migraine headaches, reaching 28% [20]. A study conducted in 2004, reported that tension-type headaches and migraines were prevalent 9.8% and 11% respectively in Swedish children aged 7-15 years [21]. Studies on back pain reported that estimates of chronic low back pain in children ranged from 8% to 21.5% [22-23]. In the United States, although the prevalence of juvenile fibromyalgia in the general population is not known, a study conducted in 1998 reported that it forms approximately 7% of new referrals to pediatric rheumatology clinics [24].

#### DEMOGRAPHIC CHARACTERISTICS AND CHRONIC PAIN

In the studies conducted by Howard [25], Lynch et al. [5], Martin et al. [6] and Perquin et al. [14], chronic pain was mostly reported in young girls, with a significant difference found in the age groups 12-15 and 16-18 years. In the study done by Martin et al., girls were three times more likely than boys to report chronic pain. In both genders, chronic pain increased with increasing age [5-6, 25]. In a study conducted in the UK on sex differences in adolescent chronic pain [26] no sex differences were found in pain chronicity, although males and females did differ in self-reported pain experiences (females reported higher pain). Sex differences were also found in coping behaviors. Females used more social support, positive statements and internalizing/catastrophizing, whereas males reported engaging in more behavioral distraction.

Similarly, migraine headaches were significantly reported in females more than in males in Poland [20]. In the studies conducted in the Netherlands by Abu-Saad Huijer and Bandell-Hoekstra [27], Bandell-Hoekstra et al. [28], and Brink, Bandell-Hoekstra, and Huijer Abu-Saad [29], headache prevalence in elementary school children was found to be 21% among boys and 26% among girls and in high school children it was 14% among boys and 28% among girls.

#### PAIN CHARACTERISTICS

In the study of Perquin et al. [14], more than half of the respondents had pain that was present for more than three months, with 49% reporting pain frequency of at least once a week. Similarly, Martin et al. [6] reported that 60.2% of those with chronic pain had at least one to two episodes of pain per week, but frequency did not differ by gender, it only increased by age. Pain intensity among chronic pain sufferers was high in a number of studies [6, 14, 30-31] and was significantly associated with lower quality of life in the functional, psychological, physical, and satisfaction with life and health domains [32-33]. Most studies used the Visual Analogue Scale to measure the intensity of pain [5, 7, 10, 14-15, 31]. Regarding location of pain, the most frequently

reported musculoskeletal pain site was the neck [34]. For those with a single pain location, headache, abdominal pain and limb pain were the most prevalent chronic pain sites reported [14, 33]. In the study done in Sweden by Brattberg [30], 40% of the respondents reported having multiple pain locations with lumbar pain being the most frequent. Roth-Isigkeit and colleagues [16] reported that 30.4% of children and adolescents with chronic pain considered headache as the most bothersome pain, followed by abdominal pain (12.3%), pain in the extremities (12.3%), back pain (8.9%), and sore throat (3.9%). In a study conducted in Germany, 622 (83%) out of 749 children and adolescents reported experiencing pain in the last three months ; 13% reported that their pain had occurred within one to three months and 9.5% had experienced pain off and on for three months ; 22.2% of the children remembered episodes of pain persisting for 12 months [16].

#### HEALTH CHARACTERISTICS AND CHRONIC PAIN

In Sweden, a 13-year follow-up study was done to evaluate persistence of pain from school-age to early adulthood. The Health Survey, which used SF-36, showed that social, emotional and mental health were more affected than physical health among respondents with persistent chronic pain [30]. Kashikar-Zuck et al. [31] found that 75% of respondents had moderate to high scores on the Functional Disability Inventory (FDI), and that pain intensity and depression were strongly associated with functional disability. Similarly in other studies conducted using FDI, 30% of the children scored high [7] and girls scored significantly higher than boys [4].

In a study examining the associations between pain, functional outcomes, and sleep disturbances in children with chronic pain, specifically juvenile idiopathic arthritis, sickle cell disease, and headache, levels of overall sleep disturbances were high for 53% of children with chronic pain ; sleep disturbances predicted lower physical health-related quality of life and higher functional disability, based on parent report [35].

The Children Depression Inventory (CDI) was used in a number of studies to measure depression. Studies showed that 29.9% of children with chronic pain reported high levels of depression on CDI [7], 87% reported mild to moderate levels and 13% were found to be significantly depressed [31]. In the follow-up study conducted by Martin et al. [6], females with anxiety and depression were found to be at higher risk to have pain after several years than males. In the longitudinal study by Brattberg [30] using the SF-36 and the Hospital Anxiety and Depression Scale (HAD scale), mental health scores were found to be low, and 43% of those with chronic pain had high scores on HAD. In the same study, feeling of "nervousness" in the age group 10-16 was found to be a predictor for having pain later in life. Similar results were found in the 2-year follow-up study by Perquin et al. [15], where emotional problems like

feeling anxious, depressed, or irritable, were considered to be predictive factors for having pain after two years in 86% of the participants.

Coping strategies were measured in several ways to assess the thoughts and actions that children use to cope with pain. The Pain Coping Questionnaire used by Kashikar-Zuck et al. [31] and Lynch et al. [5] measured eight coping strategies. The most adaptive strategy used was problem solving, and the most maladaptive strategy was internalizing or catastrophizing [31]. Catastrophizing as a strategy was found to be strongly associated with functional disability [5].

Stress was perceived as a headache trigger by 69% of the children in the high headache severity group. Children with the highest headache severity reported the lowest Quality of Life in general and the lowest Quality of Health, as well as the most problems with regard to physical functioning, impact of headache on daily and leisure activities, physical symptoms other than headache, and social functioning at home. In the high severity group, 64% of the children reported having been absent from school due to headache [27-29].

In a cross-sectional study in 194 adolescents aged 12 to 18 years with chronic pain, pain intensity and vulnerability contributed significantly to the variance of most quality of life domains. In addition, the authors found that coping strategies like catastrophizing and avoidance strengthened the negative relation between pain intensity and psychological functioning [33]. Similar results were reported by Hunfeld et al. [32] when studying the impact of chronic pain on the quality of life in adolescents and their families.

Most follow-up studies reported persistence of chronic pain after several years reaching early adulthood and affecting several domains in life. In the two-year follow-up study, Perquin et al. [15] showed that 49% of children and adolescents who reported pain at the initial assessment, still reported pain after one year follow-up and 30% after two years follow-up. El-Metwally et al. [34] found that after one year, 53.8% of children still reported musculoskeletal pain, and after four years 63.5% of adolescents still had the pain. Brattberg [30] reported that 20% of the participants had pain in all of the three follow-up studies that were done in 1989, 1991, and 2002. Martin et al. [6] found that 62.6% of participants still reported persistent pain after one to six years follow-up.

#### FAMILY CHARACTERISTICS

Family is an important factor when assessing pediatric pain. Family environment, parenting style, child-parent relationship and interaction, as well as family functioning, play a major role in the impact of chronic pain on the child/adolescent and on the family [8-9]. In studying the psychosocial risks for disability in children with chronic back pain, Lynch et al. [5] found that 47.6% of children with chronic pain had a family history of chronic pain, either parents or siblings. These children had a

significant functional impairment and higher levels of catastrophizing than children with no family history of chronic pain. Split and Neuman [20] found that 81% of females and 75.3% of males with migraines reported having a close family member with migraine headaches as well.

Scharff et al. [7] reported that 18% of children with chronic pain had low scores on the Family Environment Scale (FES) which measures the social environmental characteristics of families. Low scores on the FES means low levels of family support, poor relationships at home, and a disorganized daily family life.

Jordan et al. [8] provided an in-depth analysis of the impact of chronic pain on parents. Their phenomenological analysis resulted in two major themes. The first theme was labeled "Struggle for control and adherence" where parents of adolescents with chronic pain reported suffering when their child's pain could not be diagnosed, and felt a sense of being disbelieved by society. In addition, parents experienced helplessness and distress whenever there was uncertainty about pain prognosis, and they felt powerless because they were not able to help their child. The second theme was named "A very different life" where parents reported feeling that major changes in family relationships happened secondary to their child's condition, in addition to feelings of being restricted by the pain.

#### WAR, TRAUMATIC EVENTS, AND CHRONIC PAIN

The impact of disaster and trauma on physical pain perception has received little attention in the medical literature. There is limited information on the relationship of war and other forms of trauma on chronic pain perception [36]. No population-based studies were reported on the impact of war on chronic pain in the pediatric population.

Experiencing traumatic events and other difficulties associated with civil war, occupation, turmoil, and continuous unrest can be expected to affect the physical and mental health of the people living in the area [37]. Many studies have provided evidence that chronic pain is strongly associated with stress, stressful life events, and post-traumatic stress disorders (PTSD) [36, 38-40]. PTSD is highly prevalent in Lebanon (29.3%) which is significantly higher than the average prevalence rates found in populations not subjected to acts of violence [37]. Several studies have confirmed that as the level of exposure to traumatic events, such as the number or intensity of the experienced events, increases, so does the rate of PTSD [41-42], and eventually the rate of chronic pain. Pain has been reported as one of the most common symptoms in PTSD regardless of the nature of the trauma [38-39, 43].

In Lebanon, armed conflicts and civil unrest still impact the lives of millions of people. Unfortunately the vast majority of research on chronic pain has been conducted in countries least affected by armed conflict.

There is comparatively limited knowledge on the impact of armed conflicts on the general health and well-being of children living in such areas.

#### USE OF HEALTHCARE SETTINGS, TREATMENT MODALITIES AND CHRONIC PAIN

Perquin et al. [10] found 57% of children and adolescents with chronic pain to have seen a physician and 39% to have taken medications for their pain. The age group 0 to 3 years was the most likely to use medications and get a physician consultation. A positive association was found between earache, sore throat, pain frequency and intensity and use of medications and physician consultation. A negative association however, was found between educational level and physician consultation. For the age group 12 to 16 years, educational level, followed by intensity of pain, headache, and female gender were the most significant predictors for physician consultation.

Martin et al. [6] reported that 70.8% of those with chronic pain use pain medications, and this was significantly more prevalent in females than males. Lynch et al. [5] reported that 75.4% of children with chronic back pain had a history of at least one medication use for their pain management, and the most common medications used were non-steroidal anti-inflammatory drugs (41.5%).

As for the use of non-pharmacological treatments, Brattberg [30] found 30% to use physical therapy, relaxation training, and/or acupuncture for chronic pain, and only 7% used pain medications.

In a study [44] designed to look at the efficacy of adjuvant massage therapy in children and adolescents who presented to a chronic pediatric pain clinic for management, after the massage therapy, patients reported highly significant improvement in their levels of distress, pain, tension, discomfort, and mood compared with their pre-massage ratings. In a study on treatment preferences for Complementary and Alternative Medicine (CAM) in children with chronic pain, over 60% of children chose to try at least one CAM approach for pain. The most commonly used CAM therapies were biofeedback, yoga and hypnosis; the least commonly used were art therapy and energy healing, with craniosacral, acupuncture and massage being intermediate. Patients with a diagnosis of fibromyalgia (80%) were the most likely to try CAM versus those with other pain diagnoses [45].

In the adult population, chronic pain is one of the most costly conditions in Western societies. A study conducted in the UK on the economic impact of chronic pain in adolescence, reported that the impact was found to be high; the mean cost per adolescent experiencing chronic pain was approximately £8000 per year, including direct and indirect costs. These costs most probably project a larger national economic burden.

In Lebanon, the use of opioids for pain control is very restricted and there are no legal policies that guide their use; at present morphine prescriptions can only be given

to cancer patients by anesthesiologists or medical oncologists. Daher et al. [2] reported that pain specialists and pain clinics, as well as adequate preparation of health-care professionals in pain management are required in Lebanon [2]. Legislative, administrative and social factors continue to play a major role in prohibiting the use of opioids for the treatment of chronic pain. The Ministry of Health (MOH) regulates the subscription of opioids and does not allow dispensing medications such as morphine and fentanyl to chronic pain patients. Such medications are reserved for the treatment of patients with malignant pain only. Moreover, the MOH has also restricted the prescription of such medications to oncologists and pain physicians only.

Based on the reviewed literature, several factors are likely to influence various aspects of chronic pain. The main predictors of chronic pain are demographics (gender, age, educational level, health insurance, and monthly income), health characteristics (presence of physical and mental illness), and exposure to war and traumatic events. These factors influence the prevalence of chronic pain, the use of healthcare services (pain clinics, hospitals, physicians clinics), satisfaction with care, different treatment modalities (pharmacological and non-pharmacological), and eventually the quality of life of children and adolescents with chronic pain.

#### CONCLUSION

Chronic pain has recently become a focus of study in children and adolescents. Chronic pain in children is increasing in prevalence, and as seen in this review, it has detrimental effects on the lives of children and their families. No studies were found on chronic pain in the Middle Eastern region where culture and perceptions of pain might be different from the rest of the world. In particular, no studies have been conducted in Lebanon, a country plagued by wars, occupation, and political and financial instability for the last 30 years. Therefore, it becomes increasingly important to recommend studying the prevalence of chronic pain and its correlates at the national level in order to provide strategies to prevent and manage it in Lebanese children and adolescents.

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#### ERRATUM

RE ARTICLE "CHRONIC PAIN : A REVIEW". *J Med Liban* 2010 ; 58 (1) : 21-27.

The concluding paragraph should read (sentence corrected is underlined).

"This review highlights the impact that chronic pain has on physical and mental health, daily activities, family relationships, employment, and economic well-being of the sufferers and family caregivers. The high prevalence of chronic pain will have an impact on the health and economic well-being of societies and nations at large.

In Lebanon, chronic pain is under-investigated ; only one cross-national study was conducted by Tsang et al. (2008) [18] that looked at prevalence of common chronic pain conditions in Lebanon and their association with depression and anxiety disorders. The Lebanese people have been living with the turmoil of war and instability for around 30 years. Several barriers to effective pain management have been reported by Abu-Saad Huijer & Daher [33] and Daher et al. [32] ; all these factors make it increasingly important to study the prevalence of pain and its correlates at the national level. This review provides a baseline for future research in this field which will help determine the extent of the problem and will provide strategies for the prevention and management of chronic pain in Lebanon."