Prevalence of perceived pain and its impact on daily lives and activities of adolescents

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SUMMARY

Having chronic pain can affect a child's development in many ways from hindering everyday functioning in family relationships to school and social disruptions. The aim of this study was to investigate the impact of perceived pain on the daily lives and activities of adolescents through measuring the 3-month prevalence of painful conditions, delineating pain features, and describing its consequences. The study was conducted in 4 preparatory and 4 secondary schools in Port-Said city. The 720 adolescent students completed the questionnaire on their own. Of the 720 adolescents, 580 (80.6%) had experienced pain during the preceding 3 months. Headache (54.1%), abdominal pain (36.6%), leg pain (30.9%), and back pain (20.2%) were the most prevalent types. Adolescents with pain reported that their pain negatively affected their sleep (50.0%), social meetings with friends (32.6%), school absenteeism (31.7%), and loss of appetite (30.7%). 41.7% of the adolescents stated that pain had been present for 12 months or more and 46.3% of them reported that their pain was moderate in intensity, while 22.3% reported that it was severe. Also, 32.8% of adolescents visited doctors and 37.8% did investigations for pain. The prevalence of pain was significantly higher among girls than among boys, $p<0.001$. Activities of daily living were statistically significantly more affected with increasing pain intensity, $p<0.001$. These study findings would increase knowledge about adolescents' pain to enable parents, teachers, nurses, and health care professionals to assist young people with pain management, allowing them to intervene positively in their conditions before they become recurrent or persistent.

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Introduction

Chronic pain is a significant problem in the pediatric population. Adolescents and their families experience significant emotional and social consequences as a result of pain and disability. The financial costs of childhood pain may also be significant in terms of healthcare utilization as well as other indirect costs such as lost wages due to time off work to care for the child. In addition, the physical and psychological sequelae associated with chronic pain may have their impact on the overall health, and may predispose to development of adult chronic pain [1,2].

Chronic pain in children is the result of a dynamic integration of biological processes, psychological factors, and socio-cultural context, considered within a developmental trajectory. This category of pain includes persistent (ongoing) and recurrent (episodic) pain, with possible fluctuations in severity, quality, regularity and predictability. Chronic pain can occur in single or multiple body regions, and can involve single or multiple organ systems. Examples of chronic pain include recurrent headaches, abdominal pain, or limb pain [3]. The nursing definition of pain is whatever bodily hurt the patient reports existing, whenever the patient says it does. The cardinal rule in the care of patients with pain is that all pain is real, even if its cause is unknown. Therefore, validation of the existence of pain is based simply on the patient's report that it exists. This definition is based on two important points. First, the nurse believes patients when they indicate that they have pain. Thus, pain is considered real even if no physical cause or origin can be identified. The second point to keep in mind is that what the patient says about pain is not limited to verbal statements. Nurses encounter patients in pain in a variety of settings, including acute care, outpatient, schools and long-term care settings, as well as the home. Thus they must have the knowledge and skills to assess pain and its effects on the patient, to implement pain relief strategies, and to evaluate the effectiveness of these strategies, regardless of the setting [4].

The pediatric nurse works as a key member of the healthcare team. Her role is to provide education to the adolescent and his/her family about pain disorders and pain management, and to help them with questions or concerns that arise during treatment [5,6]. The evaluation of a child with chronic pain should begin with a history of the current problem, including a careful description of the pain. This should involve detailing the sensory characteristics, intensity, quality, location, duration, variability and alleviating factors. It should also assess the impact of pain on daily life, e.g., sleeping, eating, school, social and physical activities, as well as family and peer interactions [7,8].

Aim of the study

This study is aimed at investigating the impact of perceived pain on the daily lives activities of adolescents. This would be attained through 1) documenting the 3-month prevalence of painful conditions among children and adolescents in schools, describing the features of those conditions in terms of location, intensity, frequency and duration, and describing their consequences in terms of restrictions of activities and healthcare utilization.

Materials and Methods

Setting: the study was conducted in eight schools in Port Said city. These included four preparatory schools (two for boys and two for girls), and four secondary schools (two for boys and two for girls).

Sample: this consisted of a stratified cluster random sample, which comprised 720 children aged 12-17 years. The schools were stratified into four strata, according to educational phase, whether preparatory or secondary, and gender, whether boys or girls. Two schools were randomly selected from each of the four strata, for a total sample of eight schools. Within the selected schools, classes constituted the clusters. Two or three clusters were randomly selected from each selected school to fulfill the required sample size. This was calculated to estimate the prevalence of any pain condition of 20% or more, with a 3.0% absolute precision and a 95% level of confidence, using the single proportion equation for dichotomous variables [9]. The required sample size turned to be 683 subjects. After adjustment for a dropout rate of 5%, it was increased to 720.

Data collection tools: two tools were used in this study, a self- administered questionnaire form, and a pain questionnaire. The form was developed by the researchers and used to collect biosocial data about adolescent's age, sex, school grade, residence, number of siblings and birth order. It also included questions about the level of education, occupation and current marital status of the adolescent's parents. The pain questionnaire was designed to evaluate the prevalence of pain in the preceding three months. Chronic pain was defined as any prolonged pain that lasted a minimum of three months or any pain that recurred throughout a minimal period of three months, at least. The location, frequency, intensity, and duration of pain were addressed by the questionnaire. Choices for pain location were head, back, abdomen, arm, leg, ear, throat, chest, pelvis, tooth, or other. For pain that was described as the main discomfort, the participants were asked to specify the duration, frequency and intensity of the pain. Pain intensity was assessed with the Word-Graphic rating scales [10].

In addition, the questionnaire described the consequences of pain among adolescents in the form of restrictions of daily life activities, as well as healthcare utilization. The type and extent of personal impairment attributable to pain were assessed in the areas of sleep, eating, missed school days, hobbies, social contacts and healthcare utilization in terms of doctor's visits and pain medication. The participants were asked to rate the impact of the pain in these areas as "yes", "sometimes" or "no." Moreover, they were asked whether they had a medical diagnosis for their pain. Furthermore, the participants were asked whether a family member experienced recurrent or chronic pain. Lastly, they were asked whether they became worried due to this pain or not.

***Pilot study*:** a pilot study was carried out on a sample of adolescents of different ages in a school other than the selected ones. Their number was 70, about 10% of the main study sample size. Needed modifications were done in the form of re-phrasing and/or omission of some items. The pilot also helped to estimate the time needed for filling the questionnaire forms. Subjects included in the pilot were not included in the main study.

***Methods*:** the required official steps were taken to get the approval of carrying out the study from the local directorate of education. Letters were issued to headmasters of selected schools asking indicating the agreement of the directorate to conduct the study, and asking for cooperation with the researcher. Meetings were held with individual headmasters, where the researcher explained the purpose of the study. Oral consents were obtained before any student participated in the study. Ethical considerations were taken into account, and professional advice was provided to any affected student, whenever needed. The students were first surveyed with the pain

questionnaire. If the answer to the first question asking about the experience of pain within the past three months was no, then no other questions needed to be answered. Children who reported pain within the preceding three months were asked to continue the questionnaire. The field work was carried out during March 2005.

Results

The socio-demographic characteristics of the studied children are illustrated in **Table 1**. It shows that the age ranged between 12 and 17 years, with a mean 14.2±1.5 years. Slightly more than half of the children (50.3%) were males. Nearly one third of them (32.8%) were first born, while 17.1% were fourth or more in birth order. The number of siblings ranged between none (zero) and ten. As shown in **Table 2**, the highest percentage of mothers (38.2 %) had secondary education, and more than half of them (55.4%) were housewives. Meanwhile, the highest percentage of the fathers (40.1%) had completed university education, and only 3.6% of them were illiterate. They were mostly employees (61.5%). Family history of pain was present among 28.4% of the children.

The majority of studied children reported having suffered from pain within the last three months. As **Figure 1** displays, such pain was present among 80.6% of children in the study sample. **Table 3** indicates that the most common pain sites reported by studied children were the head, abdomen, legs, back and throat. The 3-month prevalence rate of pain in these sites was respectively 54.1%, 36.6%, 30.9%, 20.2%, and 19.1%. In slightly less than half of the sample (45.5%), pain was reported in only one location. Meanwhile, 28.1% of the children complained of pain in three or more locations. When the studied children were asked about the most bothersome pain, headache was at the top of the list (33.6%), followed by abdominal pain (17.9%), and pain in the legs (16.7%).

Table 1. Characteristics of children in the study sample (n=720)

	Frequency	Percent
Age (years):		
12	97	13.5
13	184	25.6
14	142	19.7
15	157	21.8
16	64	8.9
17	76	10.6
Range	12.0-17.0	
mean±SD	14.2±1.5	
Gender:		
Male	362	50.3
Female	358	49.7
Number of siblings:		
0	11	1.5
1	101	14.0
2-3	462	64.2
4+	146	20.3
Range	0-10	
mean±SD	2.7±1.2	
Birth order:		
1	236	32.8
2-3	361	50.1
4+	123	17.1

The duration, frequency, and intensity of pain among adolescents suffering from pain in the study sample are displayed in **Table 4.** The duration was mostly (41.7%) 12 months or more. As for the frequency of pain occurrence, about one fourth (25.7 %) of children reported daily pain episodes. At the other extreme, 17.8% of the children stated that their pain occurred only once per month. Concerning the intensity of pain, it was moderate in the highest percentage of children (46.3%). Meanwhile, 22.3% of them reported their pain was severe and it was unbearable among 14.6%. As for the precipitating

factors for pain, decreased sleeping hours was most commonly mentioned (21.0%), followed by climate changes (19.0%), and exams (17.4%). The least mentioned factors were specific types of food and certain stimulants, 2.8% and 1.9%, respectively.

Figure 1. Suffering from pain among children in the study sample (n=720)

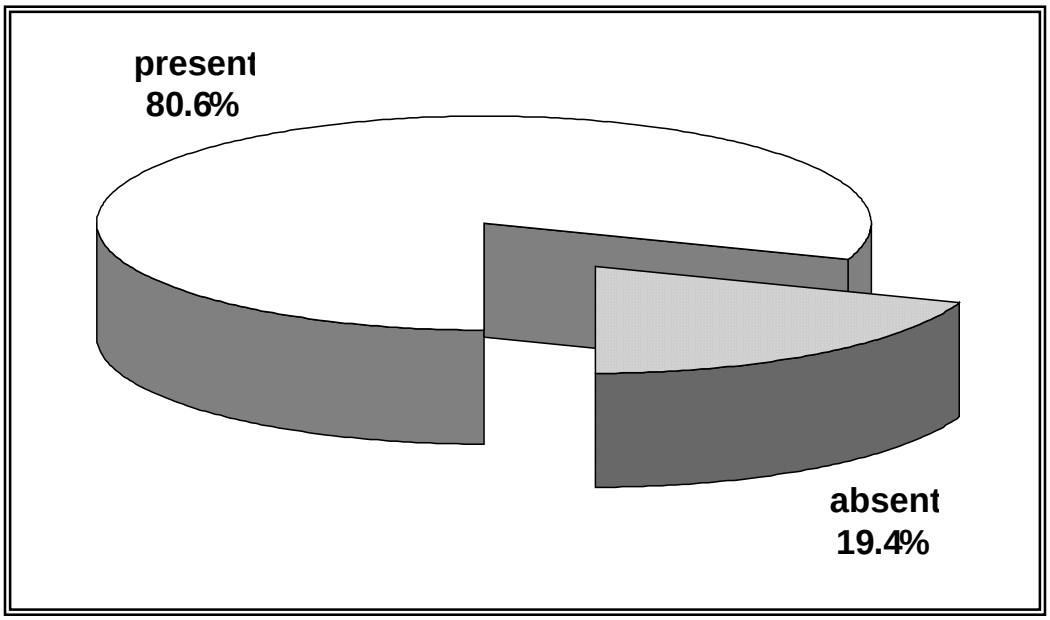

Table 2. Characteristics of parents of children in the study sample (n=720)

	Frequency	Percent
Mother education:		
Illiterate	62	8.6
Read/write	94	13.1
Basic	69	9.6
Secondary	275	38.2
University	220	30.6
Mother job:		
Working	321	44.6
Housewife	399	55.4
Marital status:		
Married	675	93.8
Divorced	14	1.9
Widow	31	4.3
Father education:		
Illiterate	26	3.6
Read/write	82	11.4
Basic	69	9.6
Secondary	254	35.3
University	289	40.1
Father job:		
Employee	443	61.5
Manual worker	227	31.5
Not defined (abroad/retired/deceased)	50	6.9
Positive family history of pain	165	28.4

As **Table 5** indicates, about one fourth of the subjects (27.1%) had no such precipitating factors, while about one third (33.6%) had two or more. The effects of pain were also investigated. **Table 6** shows that it led to anger in more than two thirds of the children (69.8%). Moreover, half of them (50.0%) reported sleep disturbances attributable to pain, and in about one third (32.6%) pain prevented them from social meetings with friends. Other effects included loss of appetite (30.7%), absence from school (31.7%), and inability to study (27.9%). Overall, the total activities of daily living were affected by pain among about one third of the participants (34.0%). As for management of pain, about one third have visited doctors for pain (32.8%). Meanwhile, less than one third (28.6%) had taken medications, while more than one third (37.8%) did investigations for pain.

The relation between pain and children and parents' characteristics has revealed two statistically significant associations, namely with child age ($p<0.001$), and gender ($p<0.001$). As **Table 7** illustrates, the percentage of children having pain was highest at the ages of 13 and 14 years (29.0% and 19.8%, respectively), while it was mostly absent at the age of 15 years (42.1%). Also, the table shows more females suffered from pain, compared to males (52.9% and 36.4%, respectively).

Table 3. Site of pain among children suffering from pain in the study sample (n=580)

	Frequency	Percent
Site:		
Head	314	54.1
Abdomen	212	36.6
Legs	179	30.9
Back	117	20.2
Throat	111	19.1
Chest	70	12.1
Arms	40	6.9
Ears	34	5.9
Pelvis	13	2.2
Teeth	81	14.0
Other:		
Eyes	13	2.2
Loin	14	2.4
Nose	1	0.2
Neck	1	0.2
Number of sites:		
1	264	45.5
2	153	26.4
3+	163	28.1
Most painful/bothersome site:		
Head	195	33.6
Abdomen	104	17.9
Legs	97	16.7
Back	53	9.1
Throat	39	6.7
Teeth	30	5.2
Chest	29	5.0
Other	14	2.4
Arms	12	2.1
Ears	6	1.0
Pelvis	1	0.2

Regarding the relation between pain characters and affection of daily life activities, **Table 8** points to statistically significant association with pain intensity ($p<0.001$), having done investigations ($p<0.001$), family history of pain ($p<0.001$), and pain leading to anger ($p<0.001$). As the table demonstrates, daily life activities were affected with the increase of pain intensity, and was associated with a higher percentage of doing investigations (50.8%), more family history (37.1%), and more anger (82.7%).

Discussion

Children and adolescents frequently experience pain. The 3-month prevalence of pain in the present study was 80.6%. A close figure was reported in a previous study where out of the 749 children and adolescents, 622 (83%) had experienced pain during the preceding 3 months [11]. Headache is the most common pain disorder among children and adolescents [12]. An important finding of the present study was that headache was the most bothersome pain, as reported by participants. This might be attributed to the fact that headache would have a negative effect on all types of activities of daily living. According to the study, in one third of the studied children, pain affected their total activities of daily living. This interpretation is in line with another study that found that recurrent headaches have an impact on child's life in a number of ways, including school absences and reduction in performance, decreased home and family interactions, and decreased socialization with peers [13]. Abdominal pain was the second most bothersome pain reported by studied children.

Table 4. Duration, frequency, and severity of pain among children suffering from pain in the study sample (n=580)

	Frequency	Percent
Duration:		
Once	6	1.0
Less than one month	34	5.9
1-<3 months	94	16.2
3-<6 months	111	19.1
6-<12 months	93	16.0
12 months or more	242	41.7
Frequency:		
<1 /month	50	8.6
1 / month	103	17.8
2-3 / month	100	17.2
1 / week	64	11.0
2-3 /week	114	19.7
Daily	149	25.7
Intensity:		
Mild	97	16.9
Moderate	266	46.3
Severe	128	22.3
Unbearable	84	14.6

Table 5. Precipitating factors for pain among children suffering from pain in the study sample (n=580)

Precipitating factors:	Frequency	Percent
Decreased sleeping hours	122	21.0
Climate change	110	19.0
Exams	101	17.4
Anxiety	90	15.5
Sadness	69	11.9
TV watching	63	10.9
Computer use	48	8.3
Noise	45	7.8
Menses	43	7.4
Candies	28	4.8
Specific type of food	16	2.8
Stimulants	11	1.9
Number of precipitating factors:		
0	157	27.1
1	228	39.3
2+	195	33.6

This result is in agreement with another study that has similarly reported that more than one third of children complained of abdominal pain lasting two weeks or longer [4]. On the same line, it has been mentioned that recurrent abdominal pain is a common reason for children to see a doctor. About one third of studied children in the present work have visited a doctor for pain [15].

Table 6. Effect of pain and its management among children suffering from pain in the study sample (n=580)

	Frequency	Percent
Pain leads to anger	405	69.8
Pain negatively affects:		
Sleeping hours	290	50.0
Social meetings with friends	189	32.6
School absenteeism	184	31.7
Loss of appetite	178	30.7
Social interaction within family	172	29.7
Study / homeworks	162	27.9
Sporting	144	24.8
Total activities of daily living:		
Affected	197	34.0
Not affected	383	66.0
Management of pain:[@]		
Visited doctor	190	32.8
Did investigations	219	37.8
Taking medications	166	28.6

(@) not mutually exclusive

Regarding pain in legs, the results of the present study showed that this type of pain was the third most bothersome pain as reported by studied children. This might be interpreted by the large number of children and adolescents practicing sports and games at this age, which might be associated with minor or moderate types of musculo-skeletal pain. This view is in congruence with the "Keep Kids Healthy" study, where it was mentioned that it is very common for children to complain of knee pain, especially adolescents that are active in sports [16].

According to the present study findings, back pain was the fourth bothersome pain type, and also the fourth in its frequency of occurrence, being reported by about one fifth of participants. This pain might be attributed to high level of physical activity at this age, in addition to the commonly mentioned factor of carrying heavy backpacks. In this regard, it has been reported that the prevalence of nonspecific back pain increases dramatically during adolescence from less than 10% in preteens up to 50% in 15-16 years olds. Also, statistically significant associations were found between back pain and backpack use, female gender, body mass index, general health, physical functioning and bodily pain [17]. Meanwhile, British researchers have studied the prevalence of low back pain in school-age children and the factors that increased a child's risk for back pain. Their results have indicated that the physical stress of carrying a heavy backpack is not a major cause of childhood back pain. Children with emotional difficulties or who participated in sports were more likely to complain of back pain [18]. Nearly one third of the present study participants who had pain visited doctors and were taking medications for pain. This is supported by the finding that about one third were complaining of severe and unbearable pain, which would force them to visit a doctor and take medications to relieve this pain. In this respect, it has been suggested that health care utilization because of pain varied according to pain location. Children and adolescents with abdominal, limb and/or back pain more often reported visiting a doctor than did those with headache [19]. In contrast, children and adolescents with headache most often reported taking medication for their pain. In accordance with these results, the use of medications among 50% of children with persistent or recurrent headaches or migraines has also been reported [20].

The most frequent triggers for pain perceived by participants in the present study were lack of sleep and daytime sleepiness, climate changes, examinations, anxiety, sadness and length of exposure to media such as television and computers. These results are in accordance with a study that found that 12.8% of participants reported that their pain was triggered by television or computer use and 16.2% by lack of sleep. Similar proportions of children and adolescents perceived psychological factors as triggers of pain [21]. The present study was also aiming at documenting the impact of pain experienced by children and adolescents. More than

one third of the respondents reported restrictions of total activities of daily living resulting from pain. Half of the participants have reported sleep disturbances attributable to pain. This is in agreement with a study that has also added that sleep disturbances among children affect many areas of their lives, including school attendance and performance, emotional state and relationships with family members and friends.

Table 7. Relation between pain and children and parents' characteristics

	Pain				X^2 test	p-value
	Present		Absent			
	No.	%	No.	%		
Age (years):						
12	76	13.1	21	15.0		
13	168	29.0	16	11.4		
14	115	19.8	27	19.3	51.73	<0.001*
15	98	16.9	59	42.1		
16	57	9.8	7	5.0		
17	66	11.4	10	7.1		
Gender:						
Male	273	47.1	89	63.6		
Female	307	52.9	51	36.4	12.29	<0.001*
Number of siblings:						
0	9	1.6	2	1.4		
1	78	13.4	23	16.4	0.98	0.81
2-3	373	64.3	89	63.6		
4+	120	20.7	26	18.6		
Birth order:						
1	184	31.7	52	37.1		
2-3	296	51.0	65	46.4	1.53	0.47
4+	100	17.2	23	16.4		
Mother education:						
None	131	22.6	25	17.9		
Basic/secondary	267	46.0	77	55.0	3.72	0.16
University	182	31.4	38	27.1		
Mother job:						
Working	264	45.5	57	40.7		
Housewife	316	54.5	83	59.3	1.05	0.30
Marital status:						
Married	544	93.8	131	93.6		
Divorced/widow	36	6.2	9	6.4	0.01	0.92
Mother education:						
None	85	14.7	23	16.4		
Basic/secondary	263	45.3	60	42.9	0.41	0.82
University	232	40.0	57	40.7		
Father job:						
Employee	352	60.7	91	65.0		
Manual worker	185	31.9	42	30.0	1.42	0.50
Not defined(abroad/retired/deceased)	43	7.4	7	5.0		

(*) statistically significant at p<0.05

Moreover, sleep disorders with frequent nocturnal arousals or daytime somnolence are common among children suffering from chronic headaches, migraines or juvenile rheumatoid arthritis [22]. Furthermore, pain may have a negative effect by interfering with sleep and thereby hampering recovery from an acute illness or decreasing appetite [4]. This might also explain the high percentages of school absenteeism and/or problems with school activities. In the present study, about one third of participants reported school absenteeism attributable to pain.

Restrictions on maintaining social contacts and activities with same age friends are other important signs of chronic and recurrent pain conditions. In the present study, about one third of respondents reported not being able to socialize with their friends due to pain. This is in congruence with what had been emphasized that chronic pain may affect the person's quality of life by interfering with work or interpersonal relationships [4]. According to the present study findings, there was a statistically significant association between the presence of pain and age.

Table 8. Relation between pain characters and affection of daily life activities among children

	Activities of daily living				X^2 test	p-value
	Affected		Not affected			
	No.	%	No.	%		
No. of pain sites						
1	83	42.1	181	47.3		
2	59	29.9	94	24.5	2.20	0.33
3	55	27.9	108	28.2		
Duration (months):						
<1	11	5.6	29	7.6		
1-<6	66	33.5	139	36.3	1.55	0.46
6+	120	60.9	215	56.1		
Frequency:						
1 / month or less	48	24.4	105	27.4		
1/week – 2/month	55	27.9	109	28.5	0.84	0.66
>= 2/week	94	47.7	169	44.1		
Intensity:						
Mild	20	10.2	77	20.3		
Moderate	75	38.3	191	50.4	29.62	<0.001*
Severe	59	30.1	69	18.2		
Unbearable	42	21.4	42	11.1		
No. of precipitating factors:						
0	48	24.4	109	28.5		
1	74	37.6	154	40.2	2.79	0.25
2+	75	38.1	120	31.3		
Investigations:						
Done	100	50.8	119	31.1		
Not done	97	49.2	264	68.9	21.46	<0.001*
Family history of pain:						
Present	73	37.1	92	24.0		
Absent	124	62.9	291	76.0	10.86	<0.001*
Suffering family member:						
Fathers	11	15.1	16	17.4		
Mothers	35	47.9	50	54.3	1.42	0.49
Siblings	27	37.0	26	28.3		
Pain leads to anger:						
Yes	163	82.7	242	63.2		
No	34	17.3	141	36.8	23.61	<0.001*

(*) statistically significant at p<0.05

The frequency of pain was found to peak at the age of 13 years. This can be attributed to the fact that early adolescence begins from age 10 to 13 years, and there are physical and physiological changes during this period, which may be accompanied with pain. In this regard, it has been stated that early adolescence, with the onset of puberty and physical and psychological changes, involves a great deal of stress and pain for children and families [23]. Also, in the present study, pain turned to be statistically significantly higher in females, compared to males. This can be attributed to the fact that a considerable proportion of the precipitating factors for pain is menses, which may increase the prevalence of pain among girls than boys. Moreover, pain in children is multidimensional and is affected by gender, genetic

variations, emotional status, temperament, developmental level, culture and ethnicity, and previous parental response to the child's pain [24,25].

Investigations done were significantly high when the activities of daily living were affected, as revealed from the present study findings. On the same line, it has been reported that fear and frustration are often fuelled by unhelpful or inaccurate diagnosis such as functional or psychosomatic pain. Families often interpret these labels as blaming them for the child's pain, and the labels tend to reinforce their need to move from doctor to doctor in search for a different diagnosis and cure [26]. Also, pain leading to anger was statistically significantly higher when the activities of daily living were more affected. These present study results are in agreement with what has been reported that pain for an extended period of time often results in disability. Patients with a number of chronic pain syndromes report depression, anger and fatigue. They also score lower on quality of life measures [27, 28].

Recommendations

In view of the foregoing findings, the following recommendations are proposed.

- Pediatric centers need to develop chronic pain management programs, with inter-collaboration among various centers
- Pain management should be part of the educational curriculum of all health professionals who care for children, e.g., assessment and management of chronic pain in children should be a mandatory part of pediatric residency. Multidisciplinary pediatric pain programs are a particularly valuable resource for this training
- Education of the public will increase community awareness and support of children with chronic pain and shape appropriate public policy. Mass media coverage of chronic pain in children should be promoted. School staff may benefit from education to facilitate reintegration and support of adolescents with chronic pain in the classroom

To help reduce the negative impact that chronic pain has on a child's life, it is important that families seek psychological services as part of the treatment approach to their child's pain problems. Further studies are necessary and may enhance our knowledge about pediatric pain to enable parents, teachers and health care professionals to assist young people with pain management, allowing them to intervene positively with their conditions before they become recurrent or persistent.

Conclusion

In conclusion, the majority of studied children have reported having suffered from pain within the last three months. The most common pain sites were the head, abdomen, legs, back and throat. The duration was mostly 12 months or more, and the intensity was mostly mild to moderate. Decreased sleeping hours was the most commonly mentioned precipitating factor. The total activities of daily living were affected by pain among about one third of the participants, and about one third have visited doctors for pain. Pain had statistically significant association with child age and gender. Affection of daily life activities increased with pain intensity.

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