



Epidemiology of Chronic Pain in Children and Adolescents

with an emphasis on headache

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Topics

- Prevalence of chronic pain, in particular headache
- Quality of life of juvenile chronic pain patients
- Psychological factors of chronic pain
- Psychological interventions and their effects

Topics

Prevalence of chronic pain, in particular headache

Quality of life of juvenile chronic pain patients

Psychological factors of chronic pain

Psychological interventions and their effects

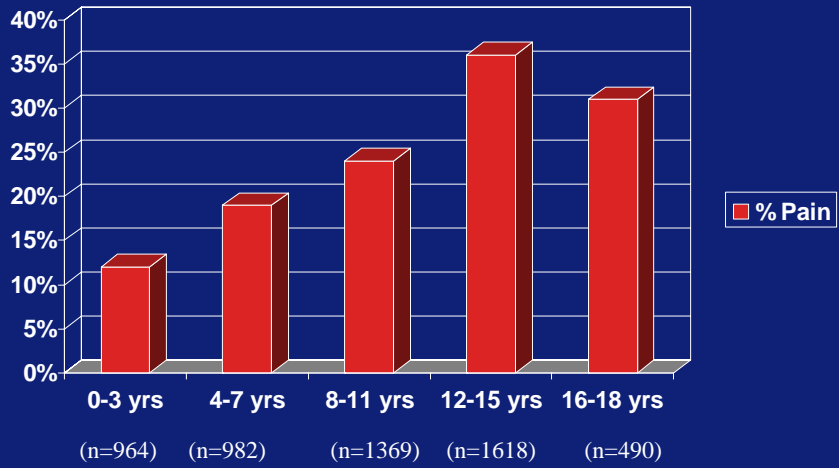
Definition of chronic pain

Pain over the previous 3 months (or longer) that was:

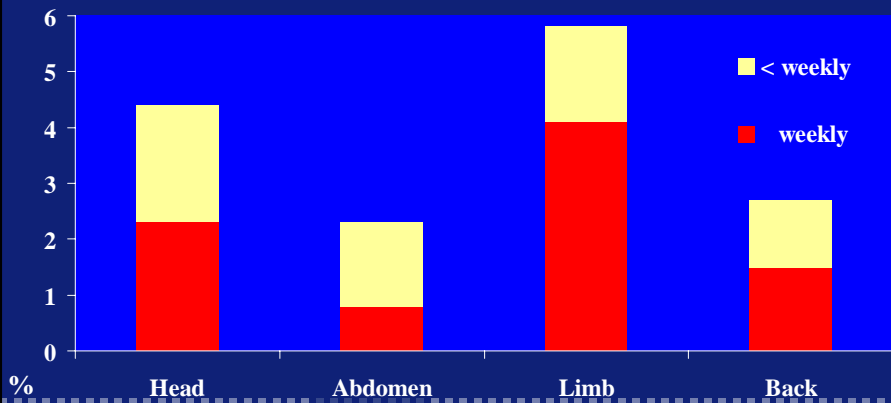
- Recurrent
- Continuous

(In adults: in the previous 6 months or longer)

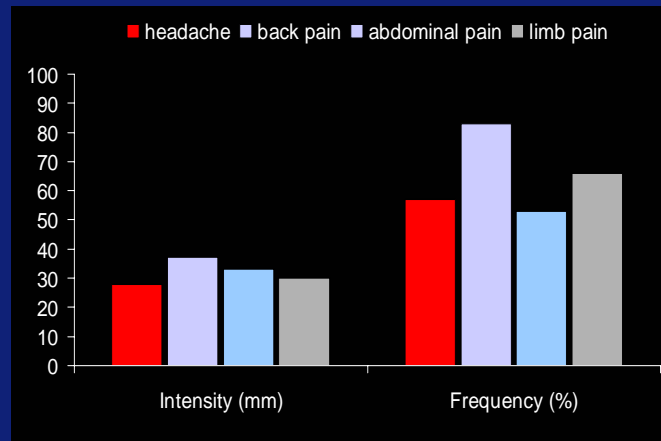
Erasmus MC
Prevalence of Chronic Pain in the Dutch community (Perquin et al, 2000)



Erasmus MC
Prevalence of chronic benign pain in adolescents (one location) (Perquin et al, 2000)



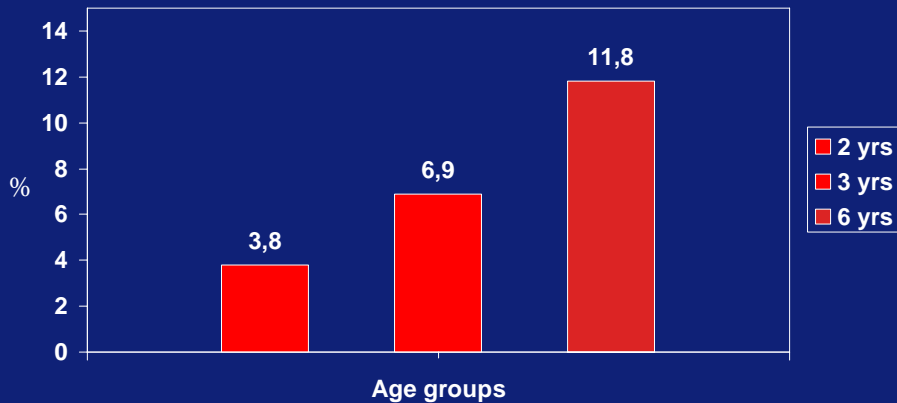
Pain intensity and frequency by location in adolescents (Hunfeld, 2001)



Prevalence of separate pain types

Abdominal pain in children
Headache in adolescents

Prevalence of RAP in children 2-6 years of age (Ramchandani et al, 2005)



Headache in children

Headache in children is very common

Prevalence is dependent of sex and age

Table 1-4 Prevalence of Headache by Age and Gender in 1,205 Children During 15 Years of Follow-Up

Age (Years)	Headache Prevalence		Migraine Prevalence		Total
	Boys	Girls	Boys	Girls	
7	50.5	49.5	2.9	2.5	2.7
14	48.6	51.4	6.4	14.8	10.6
22	36.5	63.5	—	—	—

Adapted from: Sillanpaa M. Headache in children. In: Oleson J, ed. Headache Classification and Epidemiology. New York: Raven Press, 1994, pp 273-281; and Sillanpaa M. Changes in the prevalence of migraine and other headaches during the first seven school years. Headache 1983;23:15-19.

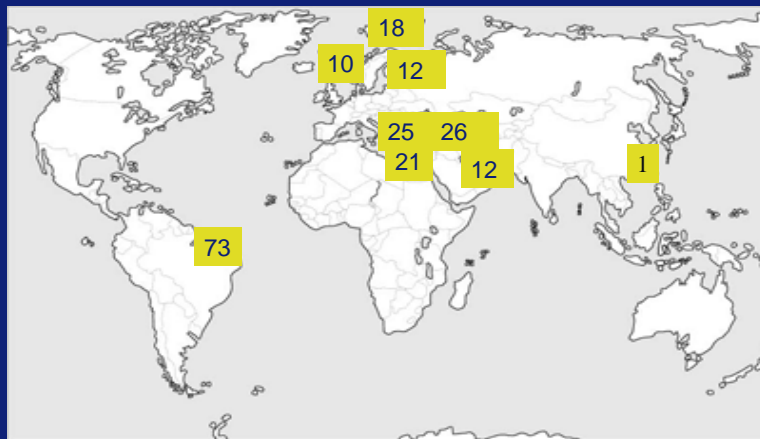
Prevalence pediatric migraine and TTH

Author (year)	Age	Sample (n)	Migraine %	TTH (%)
Antilla (2002)	12	1409	13.6	12.2
Ayatollahi (2002)	11-18	1868	6.1	12.1
Ozge (2003)	8-16	5562	10.4	24.7
Laurell (2004)	7-15	1850	11.0	9.8
Zwart (2004)	13-18	8255	7.0	18.0
Kaynak (2004)	7-21	2226	20.4
Barea (1996)	10-18	538	9.9	72.8
Shivpuri (2003)	11-15	2000	11.5
Abu-Arafeh (1994)	5-15	2165	10.6	0.9
Kong (2001)	6-13	2120	1.2	1.2
Karli (2006)	12-17	2387	14.5	25.9
Bille (1955)	7-15	9000	4.0

Pediatric migraine (%) worldwide



Pediatric TTH (%) worldwide

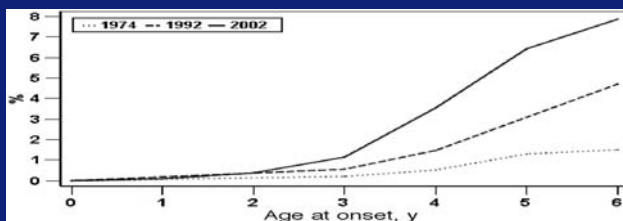


Headache increases across the decades!

Sweden from 1955-1997 In 7-15 yrs age (*Laurell et al, 2004*):
Increase in headache prevalence

Finland from 1974-2002 in 7 yrs age (*Antilla et al, 2006*):
risk for frequent headache doubled and for migraine tripled

Cumulative incidence of migraine



Comments on epidemiology of pediatric migraine and TTH

Prevalence:

Migraine: 10% (range 1%-15%)

TTH : 20% (range 1%-73%)

Variations due to:

Diagnostic criteria (became less strict)

Prevalence measure (past month – ever)

Time (increase in headache over past 3-5 decades)

Age (increase across age)

Gender (girls more headaches)

Sample ('clinical' more severe)

Overall conclusion on epidemiology

Chronic pain in children and adolescents is very common !



Topics

Prevalence of chronic pain, in particular headache

Quality of life of juvenile chronic pain patients

Psychological factors of chronic pain

Psychological interventions and their effects

The burden of chronic pain



Disability and quality of life

Type of chronic pain patient	Impaired by pain	Source
FAP/IBD	Quality of life	Yousef et al, 2006
Outpatients with unexplained pain (UCP)	School, sports, social	Konijnenburg et al, Arch Dis Child 2005
Community patients with UCP	Life and health satisfaction	Merlijn et al, Pain 2003
Outpatients with primary headache	Physical, psychosocial functioning	Nodari et al, Headache 2002
Community patients with headache/migraine	Less quality of life	Langeveld et al, Headache 1997

Impact child's pain on parent

Type of chronic pain patient	Consequence pain	Source
Tertiary ref. adolescents with chronic pain	Parental distress, parent-child dysfunctional interaction	Eccleston et al, Pain 2004
Community adolescents with chronic pain	more parental restrictions in social life and less mastery of the pain	Hunfeld et al, JPP 2001
RAP children and adolescents	Mothers feel guilty and incompetent	Smart et al, Child Care Health Dev 2005

Interviews with adolescents with different pain-locations

Head

Mental problems

Concentration
Need for solitude
Lack of interest

Back / Limb

Physical problems

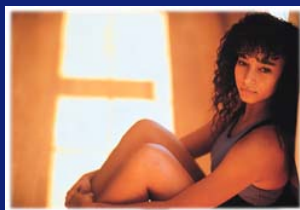
Avoidance of physical effort
Inability to maintain same posture

No understanding from others!

Adolescents with chronic pain (n=222) vs those without (n=148) (Merlijn, 2003)



Less pain attention
 $d = .27$



Less pain attention
 $d = .33$

TTH vs Migraine vs Control children in quality of life *(Bruijn et al, in prep)*

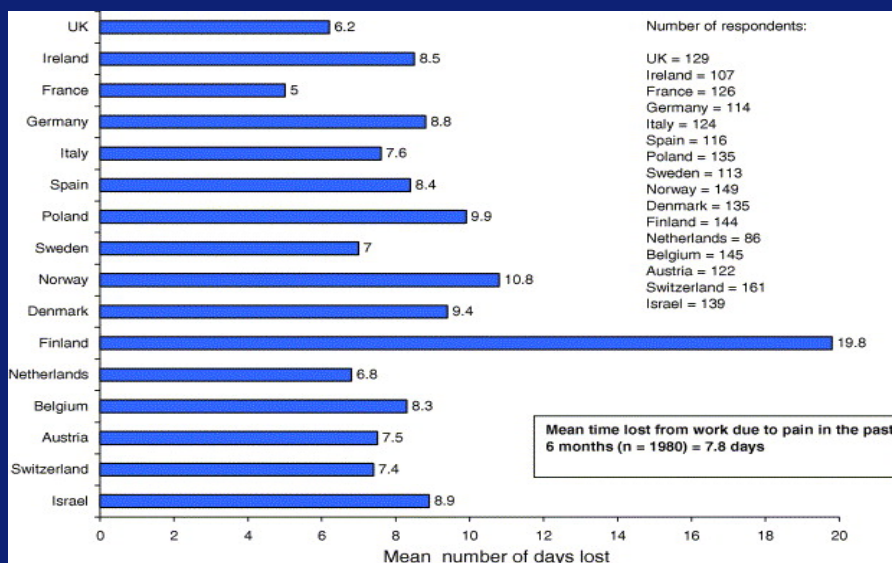


Children with chronic headache had less quality of life and family functioning than controls

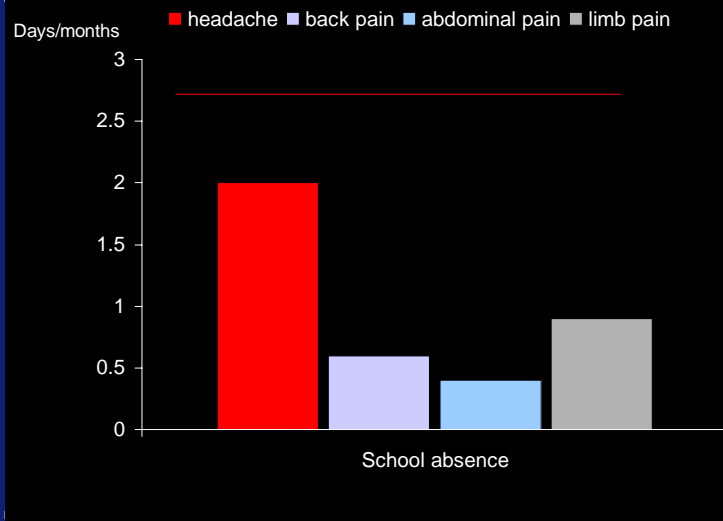
Children with TTH and migraine did not differ in quality of life or family impact

Quality of life in children with headache is similar or less than that of children with ADHD or asthma

Days lost/6 mo. from work due to pain in 16 countries *Breivik et al, Eur J Pain 2006*



School absence and pain location in adolescents (Hunfeld, 2001)



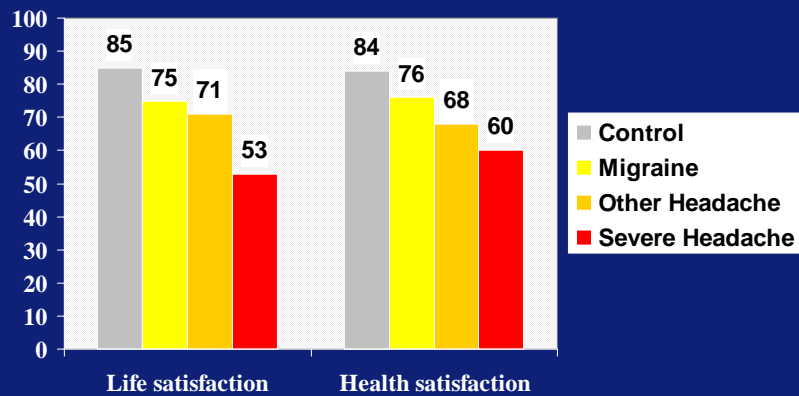
School absence due to headache

Author	Sample	Country	Days/yr
Abu-Arafeh, 1994	Community	Scotland	3
Stang, 1993	Community	U.S.	3
Amico, 2003	Clinical	Italy	68
Karwautz, 1999	Clinical	Austria	9 (Mig), 5 (TTH)
Hartmaier, 2001	Clinical	U.S.	14

Quality of life in youngsters with chronic headache

(Langeveld, 1996; Hunfeld, 2001)

VAS



Overall Conclusion on Burden of chronic pain

The burden of chronic pain in children and adolescents is severe



Topics

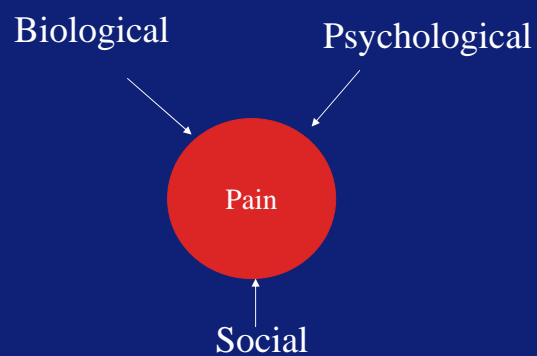
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Biopsychosocial Model



Social: it is in the family

Parent

- Mothers who discouraged coping :
- Parent's discouragement of coping in pain children:
- Parental attention to pain:
- Pain attention by mother:



Child

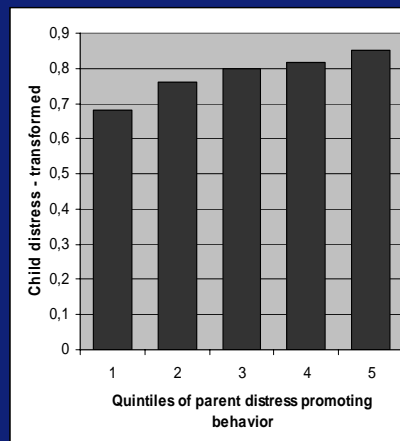
- Have non-coping pain child (*Dunn-Geier et al, Pain 1986*)
- less time on task (*Reid et al, Pain 2005*)
- double symptom complaints in children, i.p. female FAP patients (*Walker et al, Pain, 2006*)
- more pain in daughter, not in son (*Chambers et al, JPP 2002*)

The influence of parental behavior on distress in infants during a venipuncture

(*Wolff et al, in prep.*)



More parental attention to pain increases child distress



Recommendation to parents

Don't pay attention to the pain
but pay attention to your child
in pain



Psychological Vulnerability and RAP Among Children aged 2-6 yrs (Ramchandani et al, 2005)

High Scorers, %

	RAP	Non-RAP	OR (95% CI)	Adjusted OR* (95% CI)
SDQ subscale (age of 81 mo)				
Hyperactivity	13.4	10.3	1.35 (1.11-1.65)	1.43 (1.15-1.79)
Emotional	28.0	10.5	3.33 (2.84-3.91)	3.43 (2.88-4.09)
Conduct	12.9	9.9	1.35 (1.10-1.65)	1.46 (1.16-1.84)
Peer problems	8.0	6.6	1.24 (0.96-1.59)	1.43 (1.09-1.88)
Prosocial	9.1	9.5	0.96 (0.76-1.20)	0.98 (0.76-1.27)
Total difficulties	17.2	9.6	1.96 (1.63-2.35)	2.28 (1.86-2.80)
Adjusted emotional	13.4	7.1	2.03 (1.65-2.50)	2.12 (1.70-2.65)
Kutter Revised Q subscale (age of 42 mo)				
Hyperactivity	10.4	7.0	1.55 (1.19-2.05)	1.56 (1.17-2.08)
Emotional	18.8	12.6	1.62 (1.32-1.98)	1.77 (1.42-2.20)
Conduct	15.3	11.2	1.42 (1.14-1.77)	1.44 (1.12-1.85)
Prosocial	10.5	9.0	1.20 (0.93-1.54)	1.34 (1.01-1.78)
Total difficulties	14.4	8.5	1.80 (1.43-2.26)	1.84 (1.42-2.38)

Vulnerability in adolescents with headache

Author	Patients	Trait	Test
Passchier et al, 1984	Headache (gen. pop.)	Fear of failure	Sig.
Guidetti et al, 1987	Migraine (clin.)	Anxiety Depression	Sig. Sig.
Cunningham et al, 1987	Migraine (clin.)	Anxiety Depression	Ns Ns
Cooper et al, 1987	Migraine (clin.)	Anxiety	Ns
Andrasik et al, 1988	Migraine (mixed; > treatment)	Anxiety Depression	Ns Sig (d=mod.)
D'Andrea et al, 1989	Common migraine (clin.)	Anxiety	Sig (d=0,9)
Kowal et al, 1990	Headache (gen. pop.)	Anxiety Depression	Ns Ns
Romoli et al, 1991	Headache (clin.)	Anxiety, Depression	Sig
Lanzi et, 2001	Migraine and tension headache (clin.)	Test anxiety Depression	Ns Sig. Sig.
Smith et al, 2003	Migraine (clin)	Anxiety Depression	Sig (d=0,7) Ns

clinical
•6 out 8 studies: anx/dep sig

General
•1 out 2 studies: anx sig

Vulnerability and coping in headache

(Merlijn, 2003)

Adolescents with chronic pain (n=222) vs those without (n=148)

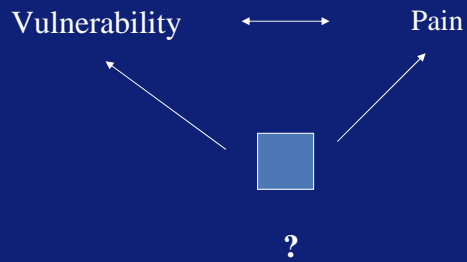
Adolescents with chronic pain are psychologically more vulnerable and use more catastrophizing coping

Vulnerability and catastrophizing are associated with a higher pain intensity

Vulnerability is the main factor



Causality problem



Overall conclusion on psychological factors

Psychological and social factors play an important role in the pain of the child and adolescent with chronic pain

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Pediatric Migraine Management around 1960



Consulting behavior and medication use in children with chronic pain (Perquin et al, 2001)



Community sample of children (0-18 yrs) with chronic pain
(n=988)

Consultation of medical expert: 61%

Medication use: 42%

Systematic review of RCTs of psychological treatment for chronic pain in children and adolescents (Eccleston et al, 2002)



- 18 trials
 - Headache:14; abdominal pain: 2; sickle cell:1
 - Relaxation:11
 - Relaxation with biofeedback: 4
 - CBT: 1
- Treatment: n=438; Control: n=370
- OR=8,8
- NNT (for >50% pain relief)=2,32 (95% CI: 1,92<NNT<2,88)
- Conclusion: good evidence that relaxation and CBT reduce chronic headache

Systematic review of RCTs on CBT in children with migraine *(Damen, Cephalalgia, 2006)*

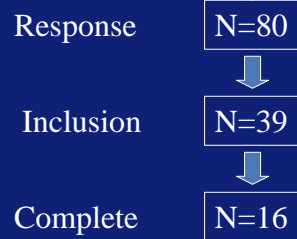
- Medline, Embase, Psychinfo, Cochrane to June 2004
- RCTs on cognitive-behavioral treatments in < 18 yrs
- 19 trials (n=834)
- HA improvement vs control:
 - Relaxation: RR=5.0
 - Relaxation + Biofeedback: RR=4.2
 - Relaxation + Biofeedback + Cogn RR=2.8
- Relaxation seems effective as prophylaxe

Where are the patients?

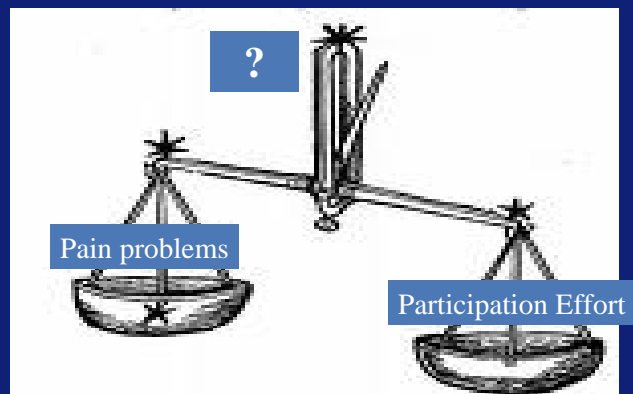


Response of Adolescents to Invitation for CBT (Merlijn, 2004)

Articles and advertisements in local newspapers	→	}	35
Advertisements in monthly magazines	→		
Pediatricians of 8 hospitals in Rotterdam	→		1
Fam physicians (5) and pharmacies (3)	→		0
Secondary schools (3) in Rotterdam	→		44



Disbalance between problems and interventions?



Motivating Children for Behavioral Interventions

Motivational Interviewing (MI) (see Jensen, J Pain, 2003; Erikson, Arch Pediatr Adolesc, 2005)

Treatment format

Internet > manual/chatbox
Mobile phone > SMS
Video games
Second Life

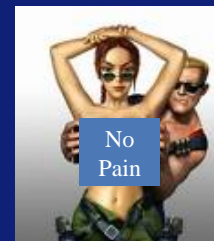


Overall Conclusion on Psychological Treatment of Chronic Pain

Psychological treatment is effective

but:

Use of e-health techniques is important



*Thank you for your
attention!*

