Low back pain in adolescents – Identification of psychosocial risk factors. Epidemiological study in Great Lisbon area

Coelho, L.; Oliveira, R.

Faculty of Human Kinetics, Technical University of Lisbon and High School of Health of Alcoitão, Portugal

Introduction

The non-specific low back pain constitutes a problem with a multifactorial origin that affects, in the developed countries, a considerable part of the population. It can have serious repercussions on different levels (functional, psychosocial and social-economical), and the juvenile population is special and frequently affected [1, 2, 3, 4], with results of prevalence of pain varying between 12% [5] and 57% [6].

There are a lot of risk factors involved on young back pain – biomechanical, anthropometrical and psychosocial – and the present problematic may have to be seen in a holistic perspective, involving multiple elements in constant interaction, in a configuration of circular and interactive causality.

The psychosocial risk factors are strictly linked to contextual nature characteristics, as to individual idiosyncratic characters, including the juvenile life styles, smoking, and diverse emotional/personality aspects (these are, in the adolescence, specially modifiable and vulnerable).

The young life styles include the extreme or competitive sport activity and the exaggerated sedentary habits, witch have been assuming a special importance, given their prejudicial consequences for the muscular-skeletal and psychological systems. Diverse authors refer that early or intense sport activity can represent the same risk of developing low back pain that the inexistence of physical activity or the celebration of sedentary habits that can prejudice the muscular-skeletal system [2, 7, 8, 9, 10].

Smoking, paradigm of a denoted public health problem, has also a relation with the non-specific low back pain. According to very studies [11, 12, 13, 14, 15] smoking is

related with lumbar pain, as is associated to diverse contextual realities, also linked to low back pain, like social and psychological ones.

The psychological dimension appears to have a crucial influence in the presence/absence and/or worsening of low back pain. Varied studies connect factors like the anterior experience, the depressive intensity and/or the anxiety level with the pain behaviour [16, 17, 18].

On the other hand, the attitude/behaviour of subject relating to the feeling pain, the signification attributed to the symptomatology, and the coping strategies developed, constitute factors capable of modifying the perception of the paining sensation and of predicting the developing of chronicle symptoms and/or functional limitations.

The self-concept, while an integrant part of personality, can influence differently the subject's perception of pain [19], principally through the influence that the referred construct exert over emotional (e.g., depression, anxiety, signification referred to pain), attitudinal and behavioural factors. In the opposite sense, the algid experience modifies frequently the self-esteem and the body notion and a lot of behaviours that influence emotional states, also modifiers of the perception of the feeling pain.

In this context, the present study had the objective of investigate the influence of psychosocial risk factors in the occurrence of low back pain during the school year 2002/2003, in adolescents, inhabitants in an urban area.

Methods

Study design. Epidemiological, retrospective, cross-sectional, descriptive and correlative study, survey style, based on instruments validated and answered for 208 adolescents.

Population and Sample. The population was constituted by young people from both sexes, with ages between 11 and 15 years old, inhabitants in the greater Lisbon area, and that frequented particular/official teach institutions, as associations, clubs and juvenile societies.

The sample was selected in function of the receptiveness and assessment to different institutions, being composed by 208 schoolchildren, with similar distribution in the sex factor (n=103 for the male sex and n=105 for the female sex) and in the diverse age groups (middle age: 12,8 $\pm$ 1,44 years).

Principal Variable and Instrument: Low back pain. This variable was conceptually defined as "all the pain complaints referred to the lumbar region (back zone) that have been lasted for at least 24 hours. The lumbar pain can also irradiate for the buttocks and legs" [3].

The present variable was measured and characterized with a self-answer questionnaire (developed, validated and applied) from Oliveira [3].

Factors at studying and Instruments: Life styles. Described as factors inherent to the existence/absence of physical activity, intensity and practice time of sport activities, and time and kind of sedentary activities realized. Smoking. Defined by the beginning age and the middle consumption in the last year. Both the variables were characterized by the questionnaire of Oliveira [3].

Self-concept (global self-concept level). Defined as the "perception that the subject has from himself as he is and in relation with the others" [23, p. 12]. This cabal psychological construct was measured through the Piers-Harris Children's Self-Concept Scale (PHCSCS). This scale has a recognized psychometric quality, including the Portuguese version validated by Veiga [24]. The instrument fidelity coefficients vary between 0.70 and 0.90, depending of the age and the kind of calculated fidelity (the scale includes internal consistency and test-retest stability).

Statistical Analysis. Data was analysed through the utilisation of SPSS 10.0. It was utilized descriptive and inferential statistical methods.

Inside the last one, it was realized variable comparisons (parametric and non-parametric statistical methods), through the effectuation of contingency tables, Chi-Square (˜2) and linear regression determination, and the utilization of correlative methods (Pearson and Spearman coefficients), with a level of significance of $p \leq 0,05$. Even more, it was utilized methods of evaluation of the relation between different factors, with multi-varied analysis of diverse factors, with determination of the spurious factorial relations and identification of intervening variables.

Results

Prevalence of low back pain in 2002/2003 and Factorial associations. Next, it is presented data that reveal the results related to the prevalence of lumbar pain and its distribution in different factors/variables: sport activity, less formal physical activities, home-school-home dislocations, time spent watching TV, time spent using video games, time spent sleeping and self-concept.

The annual prevalence of low back pain during the school year 2002/2003 reached 39,4% (n=82), and it was more elevated in the female sex (41,9%) than in the male sex (36,9%), and has increased with age (table 1). This distribution of lumbar pain prevalence in the sex and age factors is not, however, statistically significant, with significance valours of p=0.212 for the first factor and of p=0.46 for the second factor.

Table 1. Distribution of young people with and without low back pain during the school year 2002/2003 in different variables (sex, sport, activities and dislocations)

N=208	Male	Female	With sport	No sport	With act	No act.	Disl.	No disl.
Back Pain	38*	44	39	43	28	54	24	58
39,4% (n=82)	**(36,9%)†**	**(41,9%)**	(30,2%)	**(54,4%)**	(29,5%)	(47,8%)	(21,8%)	**(59,2%)**
No Back Pain	65	61	90	36	67	59	86	40
60,6% (n=126)	(63,1%)	(58,1%)	**(69,8%)**	(45,6%)	**(70,5%)**	(52,2%)	(78,2%)	(40,8%)
Total	103	105	129	79	95	113	110	98

* Valour of absolute frequency.

† Percentage valour.

Variables: Male, Female, With sport (subjects that realize sport activity), No sport (subjects without regular sport activity), With act. (With activity. Subjects that realized less formal activities but with enough effort to sweat or cause dyspnoea), No act. (No activity. Subjects that didn't realize the kind of activities defined previously), Disl. (Dislocations realized from home to school and from school to home, done by walking) and No disl. (Dislocations realized for another mean that the one referred before).

Concerning to the physical/sport activity, it is possible to verify that 54,4% of subjects that referred to not practise sport referred to have lumbar pain from Setembro/ 2002. The same tendency was verified in relation to the physical activities (excluding the before ones), with 70,5% of the activities practitioners not referring pain.

Effectively, there is an association between the sport activity and of others activities and the occurrence of low back pain, dictated by the fact that the subjects that practised less sport and less informal activities referred more lumbar pain (respectively, $\chi 2=12.013$, $p=0.001$ and $\chi 2=6.339$, $p<0.05$).

There is a significant positive association between the number of years of sport activity and the lumbar complaints ($\chi 2=25.976$, $p<0.0001$) and between the subjects that referred to compete and the lumbar pain ($\chi 2=22.679$, $p<0.05$).

Attaining now to the factor *dislocations home-school-home*, it was verified a prevalence of low back pain clearly superior (59,2%) in subjects that referred not effectuate the dislocations by foot, being the present association statistically significant ($\chi^2=30.300$, $p<0.001$).

Respecting to the sedentary activities, both the *television consumption* and the *video games utilization*, the prevalence of lumbar pain is superior for the time group *from 11 to 15 hours* (72,5%). The statistical association between the referred factors and the pain occurrence is significant both for the *television consumption* ($\chi^2=28,953$ $p<0.001$) and for the *time spent using video games* ($\chi^2=34.389$, $p<0.001$).

Also significant is the relation between the *time spent sleeping* and the occurrence of low back pain, with a pain prevalence superior at the time group *from 11 or more hours*, both for the week days ($\chi^2=13.224$, $p<0.01$) and the weekends ($\chi^2=21.885$, $p<0.001$).

Table 2. Prevalence of low back pain in the diverse time groups for the *television consumption* and *utilization of video games* activities

	Activities	Until 5 hours*	6 to 10 hours	11 to 15 hours	16 or more hours
Pain 39,4%	Watching television	29,2%	23,3%	**72,5%**	48,6%
	Video games	36,8%	12,5%	**73,3%**	60%

* Time groups defined by number of weekly hours.

Table 3. Prevalence of low back pain in the diverse time groups for the *sleeping* activity

	Sleeping	Until 5 hours*	6 to 8 hours	9 to 11 hours	11 or more hours
Pain 39,4%	Weekly days	25%	30,2%	46,9%	**62,1%**
	Weekends	23,1%	20%	47,8%	**57,4%**

* Time groups defined by number of weekly hour

Table 4. Distribution of the young with and without low back pain by the self-concept medium

Low back pain = 39,4%	Self-concept medium	Standard Deviation
Yes	59.624	7.571
No	87.594	4.018
Total	76.567*	14.829

* Total middle of self-concept. Valours obtained by score of *PH*

The medium of self-concept (table 4) is distinctly superior in the subjects that referred not having lumbar pain (87.594 ± 4.018). It is, inclusively, possible to say that there is an association between the psychological construct variable and the occurrence of pain, with the subjects with less self-concept referring more lumbar complaints (χ^2=205.906, p<0.001). In reality, this factorial relation is the most significant of all studied – p<0.0001 – according to the linear regression, emphasizing the importance of the psychological variable for this study. Finally, attaining to the *smoking* factor, it was possible to verify that, in the 18 smokers of the sample, the 16 frequent smokers referred having lumbar pain (χ^2=26.841, p<0.001). However, despite the founded association, because the number of smokers (n=18, 16 frequent smokers) is much exiguous in relation to the number of non-smokers (n=190), it is not viable to extract from here any kind of definitive conclusion.

Point of Present and Absolute/Cumulative Prevalence. The study has put in evidence 34 young people that claimed to have lumbar pain in the precise moment of

the instrument filling, corresponding to a point of present prevalence of 16,3%. This prevalence valour is lower in the boys (n=13 and 12,6%) than in the girls (n=21 and 20%), bigger in subjects with 12 years (n=11 and 27,5%) and 15 years (n=8 and 22%) old, and bigger in sport people (n=23 and 17,8%) than in the non-sport people (n=11 and 13,9%).

Relating to the absolute/cumulative prevalence (all life complaints till de moment of filling the instruments), it was verified a valour of 48,1%, and the same increased for the non-sport (67,0%) and inactive (55,8%) subjects.

Multi-varied Analysis of factors. Attaining to the obtained valours of factorial associations, it is important to understand that there are diverse variables that seem to be associated in a relation that obscures the comprehension of the true relations of multifactorial association. So, there was a necessity of understand in what matter the self-concept level is implicated in the relation between the sport/sedentariness variables and the referred lumbar complaints (consonance with the literature and with the significance obtained in the linear regression). If a low self-concept level is associated with a bigger sedentariness level [25, 26], then, we can not be sure about the direct relation between the sedentariness and pain (probably mediated by muscular-skeletal factors). So, it is important to realize the analysis of the spuriousness of the established factorial relations, attaining to the self-concept like an intervening variable.

In order to analyse the spuriousness of the relation between the life style variables and the pain variable, the sample was divided into two subgroups, according to the self-concept medium: the group of subjects with a self-concept equal or superior to 76,6 and the group with self-concept inferior to the medium (76,6). After doing this division, it was effectuated the Chi-Square and significance (p) analysis, relative to the relation between each studying variable and the occurrence of lumbar pain, into each referred subgroup, in order to search the relations where the p valour maintains the significance (despite the sample subdivision).

In reality, only the *using video games*, *dislocations by foot* and *sport* variables maintain an 'absolute' relation with the lumbar pain occurrence (this happens because, in witch one of the self-concept subgroups, the significance valours didn't suffer alterations or suffered only non-significant alterations).

Comparing the significance of the relations between the total and each one of the subgroups, it can be seen that the association in the others variables was lost notoriously, concluding that the relation between the *watching TV*, *sleeping* and *informal activities* variables and the occurrence of low back pain is spurious (it doesn't really exist); it's only the reflex of the intersection of one intervening variable (self-concept) that, as we have seen previously, has relations with the cited psychosocial variables.

On the other hand, after the realization of the analysis of data about the sport people, we can understand that both the relation *practical years – lumbar pain* (superior to 76,6: χ^2=3.264, p=3.20; inferior to 76,6: χ^2=7.134, p=0.610) and the relation competitive level – lumbar pain (superior to 76,6: χ^2=0.702, p=0.402; inferior to 76,6: χ^2=2.411, p=1.20) are equally spurious, meaning that there is not a truth relation between the intensity/time of practice and the referred pain.

In order to search if the relation between the *self-concept* factor and the pain occurrence is spurious, it was realized a statistical analysis similar to the anterior. So, it was verified if the relation was significant in the diverse groups of each one of the psychosocial factors: number of hours watching television and using video games, time spent sleeping, dislocations, sport practice, and others physical activities. Despite some irrelevant alterations observed in the valours of significance, it was verified that the relation between the self-concept level and the lumbar pain (basilar relation: p<0.001) maintains its significance in each subgroup of each variable; this means that we can consider existing a real (non-spurious) association between the self-concept and the referred/occurred pain since September/2002 (in a period of one year).

Discussion

The annual low back pain prevalence in our sample (39,4%) is inside the interval of valours that previous studies have determined [3, 20, 21, 27], and the prevalence valour of lumbar pain closer of the obtained here corresponds to the only study, inside the analysed amount of studies, realized in the Portuguese population [39,2%; 3]. There are, however, some studies where the prevalence of pain is significantly inferior. Nevertheless, that studies are the older ones [2, 4] or comprise a younger population [5, 21, 27].

In our study, we found a significant differences in the low back pain prevalence between the sport people and the non-sport people, like on similar investigations [2, 9, 10, 28].

Relatively to the adolescents that practised sport, those who have practised sport with more intensity in terms of practice years, time of practice and most elevate competitive level, presented valours of pain prevalence significantly superior, as it has been highlighted by others authors [28, 29].

Inside the indicators of the intensity of sport practice, it was founded a significant association between the number of years of sport practice and the occurrence of lumbar pain, and between the competition/leisure level and the pain occurrence. However, when we realized the multi-various analysis, the referred relations have turned

spurious. Considering all the studies that suggest that the subjects witch compete and witch have more years of sport practice have generally a inferior level of self-concept [25, 26, 30] and all the studies that relate the psychological aspects with pain, we propose the hypothesis that, in the presence of the installed lumbar pain reality, the *time* and *competition* factors exaggerate the psychological relation of the subject with a pain that has both real and imaginary realities.

Relating to the *dislocations home-school-home* factor, it was verified the existence of a non-spurious relation between that variable and the paining factor, association already referred in others studies [31, 32]. Considering the times of dislocations, we understand that it continues to be an association between that variables and the pain occurrence. However, attaining, one more time, to the non-equalities existing between the considered subgroups, we can not take concrete conclusions from here.

Relatively to the relation between the lumbar pain and the sedentary activities, we concluded that the association between the *utilization of video games* and the low back pain factor is the only one that can be considered as absolute and definitive.

The self-concept factor is of extreme importance. This variable, besides having a direct relation with the lumbar pain occurrence, behaves also like an intervening factor of others factorial relations previously cited.

Attaining to that, it remains the idea that investigations dedicated exclusively to the study of risk factors that collaborate to a specific or generic type of pain may have to possess a large number of studying variables, including the psychological ones, usually neglected.

Considering the special study that we realized above the self-concept factor (and not forgetting the necessary prosecution of studies similar to this with ballot of factor of familiar and social natures), we had in count the prominence of the relation between this personality construct and all an amount of factors directly modifiable of pain perception. This remains us, in reality, to the psychosomatic field, essentially because the psychological factors interfere in the complex multidimensional chain of pain (consonance with the *Gate-control Theory* of Melzack & Wall), influencing its perception and modifying the resulting functional scheme.

Respecting to the absolute/cumulative prevalence point, it was obtained a valour of 48,1%, witch, besides being similar to the valour obtained in others studies [3, 7], is comparable to the founded valour on adult populations [7]. Others authors [3, 22] also claimed that the low back pain in adolescents constitutes a common public health problem and similar to the adult reality.

The obtained results also led us to infer that the condition of low back pain that tends to the repetition, becoming chronic, takes an important place in the adolescent life, because of the increase of pain severity and of the time necessary to have pain relief.

It's also important to say that in more than 2/3 of cases the low back pain took until two days to relieve, confirming others studies' results [3, 21] that claimed that lumbar pain in adolescence was, in major cases, a "benign situation" that resolves spontaneously with time ("natural history").

We have to say that the majority cases of lumbar pain (72%) lasted only between one and two days, and that, respectively in 63% and 69% of the cases, it was no necessity of resort to a health professional or some kind of treatment.

We agree with others authors [3, 21], when they say that the low back pain in adolescents is essentially a common phenomenon that must be understand like a "normal experience of life", much times forgotten in time and without the necessity of a specific therapeutic intervention.

Conclusion

The non-specific low back pain in adolescents is a common phenomenon that must be understand principally like "a normal experience of life", dependent of diverse psychosocial risk factors. The psychological factors, in specific, contribute to the way as pain is valorised, behaving especially like modifiable and intervening variables. This reality must be understand by all the health and educational professionals, in a philosophy basis of a comprising investigation and an holistic, multidimensional and interdisciplinary intervention.

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