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Risk factors for low back pain in a cohort of 1389 Danish school children: an epidemiologic study*

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Abstract This study was designed as a cross-sectional questionnaire-based survey of low back pain (LBP) in 13- to 16-year-old Danish school children. The cohort consisted of 671 boys and 718 girls in eighth and ninth grade in 46 municipal schools in three counties of Sealand. All the pupils filled in a questionnaire with LBP as the main topic and were at the same time examined by the school doctors. The first part of the questionnaire contained questions about leisure time sports activity, TV watching, PC use, job in leisure time and smoking. The second part dealt with LBP in relation to frequency and severity, influence on daily living and use of the health system. The school doctor measured body height and weight, (BMI), degree of hypermobility and the tightness of the hamstring muscles. The results showed a cumulative life-time prevalence of LBP of 58.9%, a 1-year prevalence of 50.8% and an increase in LBP prevalence of 6.4% from 14 to 15 years of age, independent of gender. Fourteen percent (141 F, 54 M) fulfilled the criteria for general hypermobility and 12.2% (45 F, 124 M) had tightness of hamstring muscles of more than 40°. Recurrent/continuous LBP in a moderate to severe degree was recorded in 19.4% of children (182 F, 88 M). This was positively correlated to female gender, BMI more than 25 kg/m^2, competitive sport for boys, poor physical fitness, daily smoking, heavy jobs in leisure time, increased use of the health system and reduced life quality. Stepwise logistic regression analysis indicates that female gender, daily smoking and heavy jobs are important associated factors for severe LBP in adolescents, with an observed probability of 46% if all factors are present. We don't know yet whether these factors are of any causal importance in the development of severe LBP.

Key words Low back pain · Adolescents · Epidemiology · Smoking · Physical activity · Hypermobility

Introduction

Low back pain (LBP) is known to be a common health problem in growing adolescents, but in spite of this, there is considerably less information regarding LBP in this age group compared with in adults. As shown in previous epidemiologic studies, the lifetime prevalence of LBP in school children varies from 11 to 71%, depending on the LBP definition, age, methodology and maybe cultural differences [1, 2, 4, 11, 18, 20, 21]. LBP at school age seems to get worse over time and could be a possible risk factor for LBP in adults [11]. The risk for developing LBP is multifactorial. Several factors such as gender, anthropometry, tightness of hamstring muscles, hypermobility, sports activities, smoking status. TV watching, sitting position and psychological and social impacts have been associated with nonspecific LBP in young people. It is ques-

tionable how many these factors are of causal importance for LBP. More than half the school children of 14 years or more in Denmark have a job in their leisure time. Some of these jobs involve heavy loads on the lower back, such as work in a supermarket, cleaning jobs and distribution of newspapers. So far, no investigations have clarified whether there are any correlations between LBP and these jobs. The aim of this epidemiologic study was to estimate the prevalence, and especially the severity, of LBP in adolescents in relation to leisure time physical activity, smoking, anthropometry, tightness of hamstring muscles and hypermobility.

Materials and methods

This study was designed as a cross-sectional cohort-based investigation of 1389 school children (671 boys and 718 girls). The population consisted of all eighth and ninth grade pupils in 46 state schools, distributed across three counties of Sealand (Roskilde, Vestsjaelland and Frederiksborg); 92.4% of them were either 14 or 15 years of age. All the school children completed a questionnaire during school time, without any assistance from an adult. A letter on the front page explained the background to the study and provided brief instructions. The questionnaire contained 35 questions, with LBP as the main point of interest. *LBP was defined as pain in the lower back and was illustrated by a text and drawing on the front page of the questionnaire.* The first part of the questionnaire dealt with the following items: sports activity in leisure time, including sports discipline, how many hours per week of practice and frequency of sports performing in the past year; the pupils own estimation of their physical fitness; time spent watching TV daily and daily PC use; job in leisure time, especially how many hours per week and whether it involved a heavy load on the lower back; and finally questions about daily smoking, including how many cigarettes per day. The second part of the questionnaire dealt with LBP in relation to frequency and severity. The initial question was: "Have you ever had pain in the lower back? (look at the drawing)" Those who responded positively (except for girls who reported LBP limited to the menstrual period only), were asked whether they had suffered pain during the last year, month, week and during that day. In addition, the pupils were asked whether they suffered recurrent (one or more LBP attacks per month) or continuous LBP in a mild, moderate or severe degree with or without sciatica (radiating pain to the leg below the knee). Inquiries were made to establish the use of analgesics; contact with the health system, such as visiting the general physician, X-ray of the lower back, treatment by a physiotherapist on chiropractor; and about the kind of situations that involve LBP and whether LBP limited sports activity and reduced life quality (Question: Does the low back pain condition limit your daily activities?). We took a special interest in pupils who had recurrent or continuous LBP in a moderate to severe degree with or without sciatica (SLBP) and in pupils who had heavy jobs in their leisure time, defined as a periodic or constant heavy load on the lower back for more than 5 h per week.

The questionnaire was tested in a pilot study of 40 pupils in eighth grade. The questionnaire data were collected on the same day as the school doctors carried out an examination of each pupil. They measured each pupil's height and weight, tightness of hamstring muscles and the mobility of joints. Tightness of hamstring was measured in a lying position with the hip flexed 90°. The extension deficit of the knee was then measured with a simple goniometer. The deficit was graduated into: below 10°, between 10° and 40°, and above 40°. Hypermobility was tested using the method described by Beighton et al. [5], with a numerical score from 0 to 9, one point for each side of the body.

1. Passive dorsiflexion of the little fingers beyond 90°
2. Passive apposition of the thumbs to the forward aspects of the forearm
3. Hyperextension of the elbows beyond 10°
4. Hyperextension of the knees beyond 10°
5. Forward flexion of the trunk with the knees straight, so that the palms of the hands rest on the floor

The criteria for general hypermobility are fulfilled if 4 out of 9 points are positive.

Statistical methods

All data were registered in a data programme (CyberLine, CyberResearch, Copenhagen) and later transferred to the BMDP system [8]. We performed a univariate analysis of new independent variables using Pearson's chi-squared test with or without Yates' control for qualitative variables, and the Mann-Whitney and Kruskal-Wallis test for quantitative variables. Five percent was chosen as the level of statistical significance. Stepwise logistic regression analysis was carried out with the BMDP system. The analysis included the following independent variables: gender, age, *BMI* (below/above 25 kg/m^2), hypermobility, tightness of hamstring above 40° daily smoking, heavy job in leisure time, sports activity (high level, frequently, now and then and no sport at all). These variables were examined against the dependent variable SLBP. At each step, we excluded variables with a 15% level of significance and included variables with a 10% level of significance. The importance of the excluded variables was tested with current controls. The utility of the statistical model was confirmed by the Hosmer-Lemeshow test [13].

Results

Table 1 shows the prevalence of LBP in the cohort over a variety of periods according to gender. The lifetime prevalence of LBP was significantly higher in girls, because the value included girls with LBP in the menstrual period only (n = 108). This group was excluded from the rest of the *statistical analysis*. There were significantly more girls with LBP during the month before answering the questionnaire, but no other significant gender differences. *We found an age-related increase in the 1-year prevalence of LBP of 13.2% (n = 94) from under 14 to over 15 years of age, including an increase in LBP from 14 to 15 years of age of 6.4% (n = 75)* without gender differences. The

Table 1 Low back pain prevalence among 13- to 16-year-old school children according to gender

	Boys *n* (%)	Girls *n* (%)	Total %	*P*-value
Lifetime[a]	334 (49.8)	484 (67.4)	58.9	0.0000
One-year[b]	331 (49.3)	374 (52.1)	50.8	NS
One-month[b]	166 (24.7)	259 (36.1)	30.6	0.0000
One-week[b]	84 (12.5)	109 (15.2)	13.9	NS
Point	29 (4.3)	44 (6.1)	5.3	NS
Total	671	718	1389	

[a] Lifetime prevalence is LBP ever including girls with LBP only in the menstrual period. This group was excluded from the rest of the statistical analysis

[b] Measured from the day the questionnaire was answered

Table 2 Significant gender differences

	Boys		*P*-value	Girls		Total %
	n	%		*n*	%	
Hypermobility	54/671	8	****	141/718	19.6	14
Hamstrings > 40 °	124/671	18.5	****	45/718	6.3	12.2
Sports in leisure time	514/671	76.6	*	480/718	66.9	71.6
Competitive sports	261/671	38.9	****	172/718	24	31.2
Better phys. fitness	213/671	31.8	****	156/718	21.7	26.5
TV > 3 h/day	105/619	17	*	82/653	12.6	14.7
Daily PC use	194/558	34.8	****	33/496	6.7	21.5
Job > 10 h/week	73/433	16.9	***	50/497	10.1	13.2
Daily smoking	58/671	8.6	****	114/718	15.9	12.4
Severe LBP	88/671	13.1	****	182/718	25.3	19.4
Analgesics-LBP	20/334	6	****	73/376	19.4	13.1
Pain in upper back[a]	68/334	20.4	****	144/376	38.3	29.9
Headache[a]	101/334	30.2	****	171/376	45.5	38.3
Abdominal pain[a]	42/334	12.6	****	133/376	35.4	24.6
Reduced life quality[a]	39/334	11.7	****	105/376	28	20.3

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; **** $P < 0.0001$
[a] Associated with LBP

Table 3 Significant differences between pupils with severe LBP (SLBP; recurrent/continuous LBP in moderate to severe degree, with or without sciatica) and **A** the total cohort and **B** those with LBP (*F* indicates the difference applies only to girls, *M* only to boys)

A	Pupils with SLBP		*P*-value	Total cohort	
	n	%		*n*	%
Gender (F)	182/270	67.4	****	718/1389	51.7
BMI > 25 kg/m^2	56/268	20.9	***	202/1378	14.7
Sport: high level (M)	47/ 88	53.4	*	261/671	38.9
Poor phys. fitness	53/270	19.6	****	193/1389	13.9
Daily smoking	70/270	40.7	****	172/1389	12.4
Heavy job	88/270	32.6	****	309/1389	22.2

B	Pupils with SLBP			Total with LBP	
	n	%	*P*-value	*n*	%
Sciatica (F)	27/182	14.8	**	36/376	9.6
Analgesics	52/270	19.3	***	93/710	13.1
General physician	72/270	26.4	****	110/710	15.5
X-ray of the spine (M)	11/ 88	12.5	*	21/334	6.3
Physiotherapist (M)	9/ 88	9.2	*	18/334	5.4
Chiropractor (M)	12/ 88	13.6	***	19/334	5.7
Reduced life quality	109/270	40.4	****	144/710	20.3

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; **** $P < 0.0001$

prevalence of sciatica was 4.7% (n = 66) of the total cohort. Of all pupils with LBP, *15.5% (n = 110) had consulted a physician,* 7.6% (n = 54) had been referred to radiography, 6.5% (n = 46) and 4.8% (n = 34) had been treated for LBP by a physiotherapist and chiropractor, respectively. Table 2 shows significant gender differences.

A total of 71.6% (n = 994) of the cohort participated in sports activities in leisure time and 5.6% (n = 78) had not participated in sports during the past year. The favourite sport disciplines for boys were soccer (33.2%), tennis/badminton (18.3%) and other ball games (team handball, volleyball and basketball) (17.1%). The girls preferred riding (20.3%), running (14.3%) and ball games (14.2%). Boys were more often involved in competitive sports and had better physical fitness (self-estimated) than girls (Table 2). The degree of sports activity/no activity at all was not associated with LBP, but a high level of sports activity in boys was positively correlated with SLBP (Table 3). *Of the LBP sufferers, 8.9% (n = 63) had reduced their sports activity and 4.2% (n = 30) had stopped all sports activity because of LBP.*

TV was watched daily by 91.6% of the cohort, 75.9% had a PC at home, among whom 15% used the PC more than 3 h day. TV watching and/or PC use more than 3 h/day were not correlated to LBP at any level.

Sixty-seven percent (n = 930) of the pupils had jobs, including 22.2% (150 F, 159 M) who had heavy jobs, which were significantly related to SLBP (Table 3).

Table 4 Pupils' responses to the question concerning situations that provoke low back pain, according to gender

	Boys		*P*-value	Girls		Total %
	n	%		*n*	%	
Lifting/carrying heavy objects	124	(37.1)	**	177	(47.1)	42.4
Forward bending	80	(24)	*	118	(31.4)	27.9
Sitting position more than 1/2 h	48	(14.4)	****	106	(28.2)	21.7
Job in leisure time	61	(18.3)	NS	84	(22.3)	20.4
Carrying school satchel	28	(8.4)	****	103	(27.4)	18.5
Sport in leisure time	60	(18)	NS	55	(14.6)	16.2
Lie in bed too long	33	(9.9)	*	60	(16)	13.1
Sport in school time	24	(7.2)	*	46	(12.2)	9.9
PC use	27	(8.1)	NS	30	(8)	8
TV watching	17	(5.1)	NS	32	(8.5)	6.9
Total	334		376	710		

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; * $P < 0.0001$

Table 5 Severe low back pain prevalence in 13- to 16-year-old school children, according to gender

	Boys		Girls		Total	*P*-value %
	n	%	*n*	%		
One-year	88	(13.1)	182	(25.3)	19.4	****
One-month	77	(11.5)	160	(22.3)	17.1	****
One-week	48	(7.2)	80	(11.1)	9.2	*
Point	20	(3)	34	(4.7)	3.9	NS
Total	671		718		1389	

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$; **** $P < 0.0001$

A total of 247 pupils (17.8%) smoked cigarettes frequently, and 12.4% (58 M, 114 F) were daily smokers. Almost one-third smoked more than ten cigarettes/day. The results showed that the 1-year incidence of new daily smokers from 14 to 15 years of age was 10.2% ($n = 71$), from 6.9% to 17.1% of the total cohort. Daily smoking was significantly related to SLBP (Table 3).

General hypermobility at any level and tightness of hamstring muscles of more than 40° was not correlated with LBP in any degree.

Table 4 deals with situations causing LBP, and shows the most important was lifting/carrying heavy objects. Moreover, LBP was associated with pain in the upper back in 29.9% of the pupils, headache in 38.3%, pain in the knees in 31.1%, and muscle and abdominal pain in 25.9% and 24.6%, respectively. A total of 144 pupils (20.3%) felt that the LBP condition limited their daily activities (Table 2).

Severe LBP

Severe LBP was reported by 19.4% of pupils (182 F, 88 M). Table 5 illustrates the prevalence of SLBP over a variety of periods according to gender. The 1-year incidence of SLBP from 14 to 15 years of age was 4.2% ($n = 40$) from 17.9% to 22.1% of the total cohort. There were highly significant gender differences both among the 14-year-olds and 15-year-olds, respectively ($P = 0.0003$ and $P = 0.0002$ respectively). Table 3 shows significant differences between pupils with SLBP and the rest of the cohort. Tables 6 and 7 describe the results of a stepwise logistic regression analysis of eight independent variables *(gender, age, BMI, hypermobility, tightness of hamstring muscles beyond 40°, daily smoking, heavy job in leisure time and sports activity)* against the dependent variable SLBP. The three most important factors associated with SLBP were female gender, daily smoking and heavy job in leisure time.

Table 6 The three most important factors associated with severe LBP in adolescents

	Odds ratio	95% confidence limits
Female gender	2.14	1.61–2.86
Daily smoking	3.03	2.14–4.30
Heavy Job	1.95	1.43–2.65

Table 7 Observed and predicted outcome for severe LBP in adolescents according to LBP three risk factors

	n	Observed probability	Predicted probability	SE[b]
No factors[a]	46	0.0981	0.0985	0.0115
Three factors	17	0.4595	0.5802	0.0483

[a] Male sex, no daily smoking, no heavy job
[b] Standard error of predicted probability

Discussion

This study confirms that the prevalence of LBP in school children is relatively high. Our measurements of 1-year, 1-month, 1-week and point prevalence of LBP (Table 1) seem to be higher than those in other reports [2, 3, 18]. These variations could be related to the LBP definition and to differences between populations and maybe the

time factor. *(Burton et al. found that the annual incidence of LBP increased from 12% to 21.5% between the ages 12 and 15 years, with the greatest increase occurring in the final year (7%).* Our results showed almost the same increase of LBP from 14 to 15 years of age (6.4%) and confirms the trend of LBP to worsen over time [7]. In accordance with another report we found that 4.7% of the total cohort had sciatica [4]. These results are in contrast to a Finnish study, which found sciatica in only 1.7% of 14-years-olds [20]. Balague reported that TV watching for more than 2 h per day is related to increased frequency of LBP, but we didn' find this connection either in relation to watching TV or to using a PC for more than 3 h per day [1]. *According to the pupils answers to the question about situations that provoke LBP, watching TV is of low importance (Table 4).*

It is remarkable that no earlier studies have dealt with the adolescent's job situation as a risk factor for LBP. It is unclear to what extent pupils in other countries take up a job in their leisure time. In this study, heavy work represents an important factor associated with SLBP (Tables 3, 6 and 7). We think that too little attention is paid to this problem both at school and at home. Our results show that there could be a need for preventive measures, such as school sessions with education in back exercise, lifting techniques and how to take care of your back. *In line with Balague et al. [1] and Troussier et al. [21],* we found that smoking in school children is positively correlated with LBP, *and our results showed that daily smoking is strongly related to SLBP (Tables 3, 6 and 7). Nearly one-fifth* of the pupils were frequent smokers, *and* 12.4% were daily smokers. The reason for the greater number of smokers in this material compared to the above-mentioned studies could be explained by the fact that smoking is allowed in the majority of Danish schools, and therefore it is not as taboo as in other countries. The smoking habits may indirectly reflect psychological and social problems as the main causes in developing SLBP [4], *but we have not looked at these problems in our study.* Physical inactivity and a high level of sports activity are associated with LBP [1, 15, 20]. Our results showed that boys doing competitive sports and pupils with poor physical fitness had an increased risk for SLBP (Table 3). LBP was associated with pain in the upper back and headache, which corresponds to the findings of Salminen et al. [20]. The four most painful activities in relation to LBP in our study were: lifting or carrying heavy loads, forward bending, sitting for more than 1/2 h and job activities (Table 4). These results are not quite the same as those of two other reports [4, 17], where the painful activites were: sitting for more than 1/2 h at school and at home, standing for more than 10 min and sports activity in school and during leisure time. In our study, 15.5% of the pupils had consulted a physician, 13.1% used analgesics and 7.6% had been referred to radiography at some time because of LBP. These percentages are somewhat higher than in other studies [1, 2, 7, 10, 17], *possibly because of cultural differences and a higher prevalence of LBP in Danish school children.* We also found that 8.9% of the pupils had reduced their sports activities and 4.2% had stopped sports because of LBP – figures that are roughly comparable to two other reports [18, 20]. According to anthropometric measurements, our results showed that a BMI of more than 25 kg/m^2 is positively correlated with SLBP (Table 3), contrary to two other reports which didn't find such a correlation [3, 19]. In agreement with Salminen's study from 1984, we found that tightness of the hamstring muscles is common in growing adolescents, but is not correlated with LBP, even in cases of tightness of hamstring muscles of more than 40° [19]. This was significantly associated with LBP in two other reports [6, 16]. A few studies have shown a positive correlation between hypermobility and LBP in young people, but our results didn't confirm these findings for any degree of hypermobility or for LBP at any level at any age [5, 9, 14]. Only a few studies have pointed out a more detailed definition of low back pain problems in school children. Many reports describe non-specific LBP, but there are certainly many degrees of severity and a wide difference of frequency in this problem. *It is probable that a single attack of mild LBP once a year has no particular significance for one's health status, whereas frequent/continuous LBP in a moderate to severe degree is of much greater consequence, both now and in the future, just like findings in adults [12].* Therefore, we focused on this particular group of pupils. We found that 19.4% had SLBP, a larger number than in two other reports (respectively 8% [20] and 5% [1]). We have no good explanation for this difference, but it could *be dependent on the LBP definition, methodology* and cultural differences. SLBP was associated with increased morbidity, illustrated with increased use of analgesics and the health system and implied reduced life quality (Table 3). Stepwise logistic regression analysis of several independent variables showed that female gender, daily smoking and heavy job in leisure time are important factors associated with SLBP, with an observed probability of 46% if all three factors are present (Tables 6, 7).

Conclusion

This study suggests, in accordance with previous reports, that LBP in adolescents is a common problem that increases with age. We particularly focused on a subgroup of adolescents with a more chronic course of LBP, because this condition could aggravate during time, representing a risk for LBP in adulthood. SLBP was associated with female gender, daily smoking and heavy job in leisure time, but the importance of this finding seems rather unclear. In our opinion it illustrates the need for further investigations with more profound studies of these factors.

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Appendix

Translation of the questionnaire

The front page contains information for the school children

We are a group of medical doctos, who want to investigate and find the reasons for low back pain in school children.

We therefore ask you to fill in this questionnaire. Please, read the whole questionnaire before you answer the questions. Take one question at a time and place a cross by the answer you think is correct. If you have doubts concerning some questions, place your cross where you think it is most correct. It is very important that you answer all the questions.

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1. Do you participate in sport in school time?. Yes always – Yes sometimes – No
2. How many hours/week? _____
3. Do you participate in sport in your leisure time? Yes – No
4. If yes, how many hours/week? _____
5. What kind of sports?

Gymnastics, soccer, other kind of ball games, swimming, tennis/badminton, riding, running, cycling, roller skating, martial arts, other

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6. How active have you been with sport within the last year? Very active (e.g. competitive sport) – Regularly – Only now and then – No sport at all
7. How is your physical fitness compared with your schoolfriends of the same gender? Much better – Better – The same – Worse – Much worse
8. Do you cycle every day? Yes – No
9. If yes, how many minutes normally per day? _____
10. Do you watch TV daily? Yes – No
11. If yes, how many hours? Less than 1 h – 1–2 h – 2–3 h – More than 3 h
12. Do you have a PC at home? Yes – No
13. If yes, how often do you use the PC? Seldom – Several times per month – Daily

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14. If daily use, how many hours? Less than 1 h – 1–2 h – 2–3 h – More than 3 h
15. Do you have a job in your leisure time (at home or away from home)? Yes – No
16. If yes, how many hours per week? Less than 5 h – 5–10 h – More than 10 h
17. Does the job involve a heavy load on the back? Yes, all the time – Yes, sometimes – No – Don't know
18. Do you smoke cigarettes? No – seldom – Regularly – Daily
19. If daily smoking, how many? 1–5 cigarettes – 6–10 cigarettes – More than 10 cigarettes

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20. Have you ever had low back pain (please look at the drawing on the front page)? Yes – No

If the answer is no, your have finished the questionnaire. If yes, please continue the questionnaire

21. *Questions to girls:*

Do you menstruate? Yes – No
If no, continue with question 23. If yes, do you have low back pain in connection with the menstruation? (only one answer) No – Sometimes – Always

22. Do you have low back pain between menstruation periods? Yes – No. If no, you have finished the questionnaire. If yes, please continue with the questionnaire.

Questions to all:

23. Did you have low back pain in the last year? – The last month? – The last week? – Right now?
24. How often do you have low back pain? Seldom (a few times a year) – Regularly (one or more times a month) – Daily

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25. How would you characterize the low back pain (only one answer)? Mild – Moderate – Severe
26. Do you have radiating pain to one or both legs (this means radiating pain from the low back to one or both legs beyond the knee)? Yes – No
27. Did the low back pain involve use of analgesics? – Visit to the general practitioner? – Referral to radiography? – Treatment by a physiotherapist? – Treatment by a chiropractor? – Another treatment?
28. Do you have other complaints (at least once a month)? Pain in the upper back? – Headache? – Pain in the stomach? – Pain in the muscles? – Pain in the knees?

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29. Which situations cause low back pain?. Sitting position after 5–10 min – Sitting position after ½ h – Forward bending of the back – Standing position 5–10 min – Walking 5–10 min – Sport in schooltime – Lifting/carrying heavy objects – Job in leisure time – Sport in leisure time – Watching TV – Use of PC – Carrying school satchel – Lying in bed too long – Other causes
30. Do you know why you are suffering from low back pain? Yes – No
31. If yes, what could be the cause?
32. Has the low back pain condition led you to decrease sports activity in leisure time? – To finish with sports activity in leisure time?

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33. Does the low back pain condition limit your daily activities? Yes, much – Yes, a little – No
34. What can you do to reduce your low back pain problem? Nothing – Use analgesics – Visit the general doctor – Get treatment (e.g. physiotherapy) – Other things (e.g. back exercise) – Something else (e.g. relax)
35. Do you have any good advice on how to prevent low back pain? Yes – No – If yes, what advice? _____

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This part of the questionnaire is completed by the school doctor

36. The pupil's personal registration number
37. County
38. Height
39. Weight

The hypermobility test

40. and 41. The tightness of hamstring muscles right and left: Less than 10° – Between 10° and 40° – More than 40°

Comments concerning the back and legs

42. General health status: Good – Less good
43. Which school doctor?