

Lorna Taylor wrote in our November 2014 journal about interventions for musculoskeletal problems in school teachers. Here she discusses back pain in pupils and shares the results of a preliminary study on seating.

Back health in schoolchildren – can we ignore it any longer?

BACK PAIN and other musculoskeletal conditions account for a quarter of all UK sickness absence – that's 31 million working days lost every year. The costs to the economy are more than hosting the 2012 Olympics EVERY YEAR. Back pain has huge social and emotional costs, too.

Perhaps due to the immense economic costs, intervention and prevention tend to focus on adults. However, recent research shows that increasing numbers of children are experiencing back and neck pain.

“Increasing numbers of children are experiencing back and neck pain

Studies show 72% of primary and 64% of secondary school children report back and/or neck pain at school, with the majority of cases unreported (Webb 2013).

There are 8.3 million children attending UK schools (Department for Education, 2015), all of whom should be given every opportunity to achieve their full potential. Back pain in children has implications for the future workforce as many young adults are entering the workplace with back and neck pain already present (Murphy *et al* 2007). It also has substantial economic and public health implications when considering children's young age and the recurrence potential of the condition throughout adulthood (Trevelyan & Legg 2011).

Non-specific spinal pain in children and young people is multi-factorial in cause, but is now a well-established phenomenon and – among health, education and ergonomics professionals – is



Poor posture on typical school chairs

considered to be on the rise. Predisposing factors for school-aged children include: high body mass index, low physical activity, prolonged sitting, ergonomic risks in the current classroom environment carrying school bags, and <three hours high-level sport a week. It must also be noted that back pain in children and young people can also have other biopsychosocial elements (Murphy *et al* 2007).

It causes absence from education, conservative and pharmacological health interventions, reduced participation in physical activity and the potential to develop long-term chronic pain (Hill & Ketaing 2010, Jakes *et al* 2015). A high proportion of children affected by pain (69% girls and 51% boys) will go on to have a lifetime prevalence of back pain,



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placing enormous strain on both health and social resources (Jones & McFarlane 2009).

In addition, and fundamental to education, musculoskeletal pain causes a distraction from learning and can have a detrimental effect on a young person's life chances.

One study (Triguerio *et al* 2013) states that the probability of back pain is increased 4.4 times when school furniture was reported uncomfortable and that children with back pain were four times more likely to report sleeping difficulties – this will affect concentration at school due to tiredness and pain. However, the sleeping difficulties may come first due to anxiety or back pain. Emotional wellbeing is therefore essential for children. Preventative strategies should focus on reducing physical risk factors in addition to psychological factors to be most successful.

Children spend about 30% of their waking hours in school, mostly in a seated position (Webb 2013). This can amount

“Children spend about 30% of their waking hours in school, mostly in a seated position. This can amount to 800 hours sitting each year

to 800 hours sitting each year in furniture designed for short-period use. There are no regulations to keep posture and back health in check for children, despite the known benefits to health, wellbeing and productivity it brings adults in the workplace.

It is also important to consider that the formation of habits begins in childhood so the necessity to instil healthy movement patterns, postures and sound ergonomic advice is particularly important early on for the future prevention of potential pain and disability (Syazwan *et al* 2011).

We know that seating at work is important for adult employees and employers in terms of comfort, concentration and productivity. The Health and Safety Executive Seating at Work Guidance for adults states: “Unsuitable seating can cause people to adopt awkward postures which can lead to discomfort, back pain and upper limb disorders. This may prove costly to employers in the form of staff absences, potential civil claims and lost production. Individuals bear some of the costs in the form of lost income.”

For children whose “workplace” is their educational setting, there is no legal duty to protect them. Ofsted 2015 states its goal is “to achieve

excellence in education and skills for learners of all ages, and in the care of children and young people”. However, with schools using more and more

technology each day with minimal or no ergonomics training and limited understanding of the workplace environment, maybe a review of policies is needed to enable a more holistic and appropriate approach to pupil health and wellbeing for today’s pupils?

For every child to be safe, healthy and reach their full potential, greater emphasis needs to be placed on the school learning environment, together with awareness of ergonomics and healthy posture, especially when using technology. Perhaps this may not only have health benefits but could also improve behaviour and attainment too?

Interestingly, South Rise Primary School in inner London – previously one of the poorest performing schools in the country – moved to joint 12th nationally last year after the transformation of the school environment. It is now in the top 10% for progress (KS1-KS2). Executive head teacher Sophie Powell said: “It had a powerful effect which rippled success from the moment you stepped inside the school to the back of each classroom.”



The external environment at a primary school before intervention



Primary school – post intervention

The accelerated growth achieved within a few weeks raised expectations of stakeholders and improved the working and learning environment for staff and pupils. Ms Powell injected a new ethos throughout the wider community which promoted excellence, respect and higher standards. Momentum is gaining among educationalists that the school environment is the silent teacher.

A small, two-class study carried out in 2014 to identify any benefits of improved sitting posture and learning environment for children aged 4-6 at Nunnery First School, Somerset, produced very favourable feedback from teaching staff:

- Better quality learning can take place without the distraction from "off task" movement
- Better focus and concentration while sitting continues in a habit of more effective learning behaviours in other situations
- Children are developing an awareness of other important factors affecting their ability to learn effectively and need fewer prompts for improving learning behaviour.

After these positive results and the known increase in back and neck pain in teenagers, I wished to explore back health issues affecting secondary pupils further and to see if sitting posture has an effect on concentration, learning and back pain (as perceived by pupils themselves).

Two groups of Year 10 pupils (aged 14-15) from St John Houghton Catholic Voluntary Academy in Derbyshire completed a pre-intervention questionnaire while using their current classroom chair. Then the Max II chair, assessed and



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chosen for its improved ergonomic and non tip-back design, its flexibility to allow some movement, together with its affordability for schools, was used as the intervention by pupils for three weeks, after which a post-intervention questionnaire was completed. The two questionnaires were the same. Results of the sample of 36 pupils showed:

- 86% of pupils (96% girls and 67% of boys) had experienced back and/or neck pain within the past year
- 53% had experienced pain with the past seven days.

The top three most uncomfortable school-based activities as reported by pupils were:

- 1 carrying my school bag 67%
- 2 sitting on school chairs 47%
- 3 working at the computer 28%.

"Other" activities primarily included using science stools without backrests and using low science lab tables. The top three most uncomfortable home-based activities were:

- 1 working at my desk 19%
- 2 working at my computer 19%
- 3 working on tablet devices

6%. (It should be noted that tablet devices were not used within the school.)

Most pupils (72%) rated their pre-intervention classroom chair as uncomfortable (five or less out of 10 for comfort). Comments included:

"They hurt when you lean back on the chair."

"They squeak a lot and lean to one side as they are mostly broken."

"It's uncomfortable because they are really hard to sit on."

"Very hard and the back rest is very straight up and doesn't support my back."

“Most pupils (72%) rated their pre-intervention classroom chair as uncomfortable”

"Sitting on them for a long time gets annoying."

"The shape hurts your spine and the plastic is uncomfortable."

"They're nearly all broken and bend right back. Dig into spine and itchy on back of legs when hot."



Pupils using the Max II chair

Of the pre-intervention group who had pain in the last seven days, 75% rated their chair uncomfortable and 62% reported carrying school bags as uncomfortable. This highlights a higher correlation to chair

discomfort and pain in the last seven days than carrying school bags. However, this does not explain the reasons why.

89% of pupils surveyed pre-intervention reported that their concentration had been affected

because of being uncomfortable sitting on their school chair. 25% replied “yes – often”.

Most pupils (61%) rated their post intervention Max II chair as comfortable (six or more out of 10). Comments included:

“I find the Max II more comfortable than the usual chairs. I would generally find myself sitting straighter rather than slouching over like the previous chairs. It also helps keep me awake during the lesson.”

“The arch on the chair supports my back and helps me with posture.”

“The new one’s shaped really well.”

“Nice back rest, however they are still too hard.”

“Comfortable – keeps back straight, less back pain.”

“I like them, posture is much better and you sit up straighter. I like them because it does not make me want to slouch which makes me concentrate more.”

“It sounds strange but I actually think I’ve learnt quicker.”

Negative pupil comments post-intervention (which, as a



Lorna with champion Skeleton racer Lizzy Yarnold, designer Tom Wates (dlb) who provided the chairs for the study, and pupils

Top 10 tips for teachers to help keep children’s backs healthy in schools

- 1 Think “30:30 sit and stretch”. Limit sitting to 30 minutes, stretch and wriggle for 30 seconds.
- 2 Limit cross-legged floor sitting to 10 minutes. Encourage movement, side sitting to both sides, straight-legged sitting or cross-legged on a seat wedge cushion.
- 3 Ensure all children have a clear view of the board without twisting. If not, can they turn their chair around or move position?
- 4 Report eyesight concerns home if children are excessively hunching over their work or a screen.
- 5 Never use a laptop flat on a desk at home or at school, it should be raised up/on a stand so the top of the screen is at eye level, with a separate mouse and keyboard.
- 6 Encourage all students to learn to touch type so they are not “hunting and pecking” repetitively looking from screen to keyboard.
- 7 Recommended safe school bag weight is 10% or less of body weight. Encourage students to repack their bag each night so they only carry what they need. Safe storage areas/lockers are a healthy investment.
- 8 Physical activity is essential for back health; avoid restricting break and PE times. It’s important to promote adequate hydration, too.
- 9 Fidgeting students and those leaning back using “bucket chairs” are most likely uncomfortable, can they stand up, readjust position and sit back down again? Better still, trial and consider ergonomically designed pupil chairs as an investment to improve health and the learning environment.
- 10 Encourage children to view the Healthy Working Move Initiative at www.ergonomics4kids.co.uk – free e-learning for pupils of all ages and an accompanying ebook for parents and teachers with advice on how to protect children when using technology in the classroom and at home.

physiotherapist, I mostly found positive), included:

"I like the old ones. I can't lean back or slouch on these."

"I can't rock back on them."

"I can't get used to it, the chair makes you sit in a really upright position."

These comments suggest how poor sitting postures can become habitual from a young age and perhaps indicate that the earlier the introduction of ergonomically-designed furniture throughout a school, the more beneficial it will be to pupils in terms of encouraging

better sitting posture and promoting comfort throughout the day.

Despite some negative comments and the short intervention time, reported pain in the last seven days was 3% lower post-intervention. I would like to explore this further, with a bigger sample size.

Pupils were asked: "How important is the comfort of your school chair to your learning?" (1= not at all important, 10= essential). The average report was 7 pre-intervention and 8 post-intervention. This demonstrates that teenagers themselves recognise the

importance of sitting comfort to their individual learning. While it cannot be assumed attainment will improve because of their improved sitting comfort, there is growing recognition that if pupils feel more comfortable, engaged and able to concentrate, they are more ready to learn.

The good news is that some simple ideas, which can be easily implemented, can make a real difference to children's back health. This is an area which will hopefully gain further attention at a national level in the near future in terms of health promotion and school intervention.

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■ Information and free resources for schools can be found at: www.jollyback.com
Contact lorna@jollyback.com if you would like to get involved in school back health.