

THE AUSTRIAN MOVING SCHOOL MODEL: SCHOOL QUALITY MEANS ENABLING THE CHILDREN TO LIVE OUT THEIR NATURAL NEED FOR EXERCISE

Introduction

This discussion paper was produced as part of the multiannual research programme on musculoskeletal disorders (MSDs) carried about by the European Agency for Safety and Health at Work (EU-OSHA) between 2017 and 2020. It was developed to support the promotion of good musculoskeletal health among children and young people (through physical activity) and contribute to increasing the awareness of the importance of moving. Sitting behaviour established in childhood and adolescence is often retained in adulthood. More sitting time during work often results in musculoskeletal health problems, especially low back pain and neck and shoulder complaints. Numerous adaptations can be made to workplaces to prevent MSDs, but the most effective way is to start early and promote a more physically active lifestyle in childhood.

Moving is a prerequisite for an ideal cognitive, psychological, physical and social development in children and adolescents. However, today, children and adolescents are confronted with a much more sedentary living environment than before and, accordingly, more movement needs to be brought into preschool and school educational institutions.

At school, children are increasingly showing behaviours described in terms such as hyperactivity, attention deficit, lack of concentration, low tolerance for frustration and poor social skills in dealing with other people; children are also increasingly experiencing MSDs. Because of its interdisciplinary nature, the 'Moving School' model has the potential to be of use to all persons working in educational institutions, to address the behaviours mentioned above.

Promoting movement has to be seen as a cross-sectional task for the whole school system and, in this context, it should not be considered only a pedagogical reaction to 'sitting schools'. Originally, the Moving School approach was mainly symptom oriented, that is, taken to compensate for the lack of exercise in the classroom. As part of the development of school quality, however, it has become clearly evident that, in addition to increasing motor movement, teaching content and methods, school organisation and the learning and living spaces of schools must also change. The Moving School model now considers the whole system and is cause oriented.

For us, integrating movement into schools means causing change with the help of child-, teaching- and learning-appropriate rhythmisation, through moving learning and moving breaks. Further crucial aspects of integrating movement are participating and health-promoting organisational structures, opening the school to the outside world and networked thinking.

This type of Moving School model is consistent with the salutogenic approach of the World Health Organization (WHO), which is based on a very comprehensive concept of health and, above all, aims to promote the abilities of everyone to maintain and strengthen their well-being. This approach emphasises the strengths of each individual and thus ensures the development of resistance resources that protect against stress among pupils and school staff.

A Moving School should promote holistic learning, shaping school life and supporting school and teaching development.

Moving and moving lessons in particular increase the cognitive potential of pupils and their motivation for learning, thus forming the basis of lifelong learning [1]

The origin of the Moving School model in German-speaking countries, especially Austria

Increasing back complaints in the 1980s were taken as an opportunity to point out movement-unfriendly pedagogy by Swiss lecturer Urs Illi (ETH Zurich). In his critical observation 'Sitting as a burden' [2], he described how pupils spend 7 to 8 hours sitting, passively and monotonously, every day. Illi attributed

the children's resulting health problems to the 'still seat school': rigid furniture, static sitting postures, classes that were too large, frontal teaching forms, too few and too short breaks, and a lack of movement and physical education. This comprehensive problem was the starting point for the emergence of the concept of the Moving School, which focused on movement-promoting living conditions and movement incentives for children and teachers.

The originally pragmatic and sporty stimulus quickly became the goal of grasping movement as a comprehensive bracket for the school system. Other findings that informed the development of the Moving School concept were psychomotricity findings of Ernst Kippbart, Helmut Köckenberger and Renate Zimmer [3].

In 1992, there was a special presentation on moving lessons during the Worlddidact conference in Basel and the term *Bewegte Schule* (Moving School) was used for the first time. An international symposium on the topic was also held in Rorschach at Lake Constance in 1993 and numerous related initiatives with various approaches were formed in Germany and Austria. In 1994, the International Forum of Movement was founded, consisting of representatives from Germany (Dieter Breithecker), Austria (Sepp Mundiger) and Switzerland (Urs Illi). Manfred Wimmer (headmaster from 1989 to 2006, Volksschule Pram, Upper Austria) presented his school's approach at the Second International Symposium in Dornach (Switzerland). As a result, the Moving School in Upper Austria was developed through contact and exchange with Illi and, in the ensuing years, this concept was put into practice in different parts of Austria.

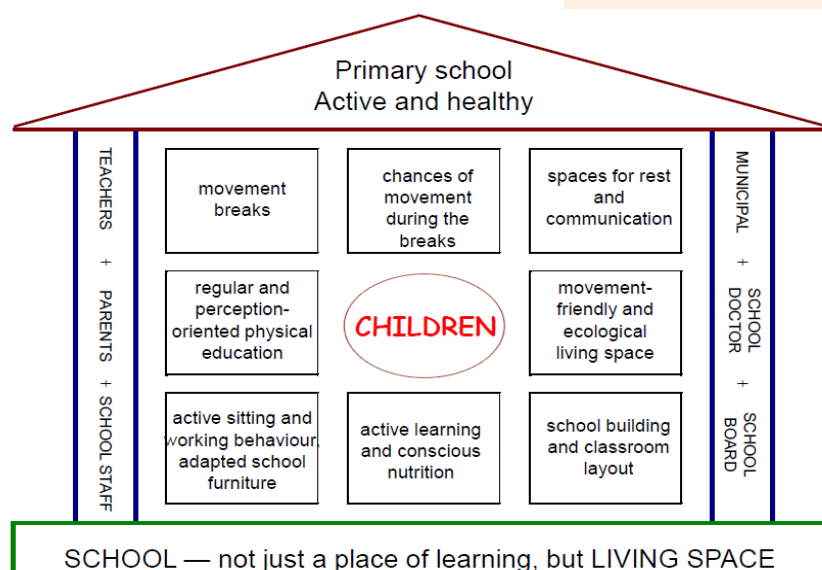
In 1998, the anthology *Bewegte Schule — Gesunde Schule* was published by Illi, Breithecker and Mundiger [4], and some actions were initiated in cooperation with the Austrian Ministry of Education.

In the following years, different initiatives had been developed in the individual federal states. Support from the Ministry of Education was reduced and materials that teachers could obtain free of charge were designed in cooperation with the AUVA (the Austrian Workers' Compensation Board) [5].

The idea was conveyed primarily through teacher training and courses, and the focus was on teaching and moving breaks. In 2010, the Moving School Austria network was founded by the federal state of Styria. This was initially coordinated by Erich Frischenschlager; Manfred Wimmer subsequently took over the coordination and development of the initiative. In 2016, the coordination was taken over by a team led by Martin Leitner and this team is now based at the University of Education Upper Austria. The federal state coordinators regularly exchange information on the further development and implementation of the Moving School.

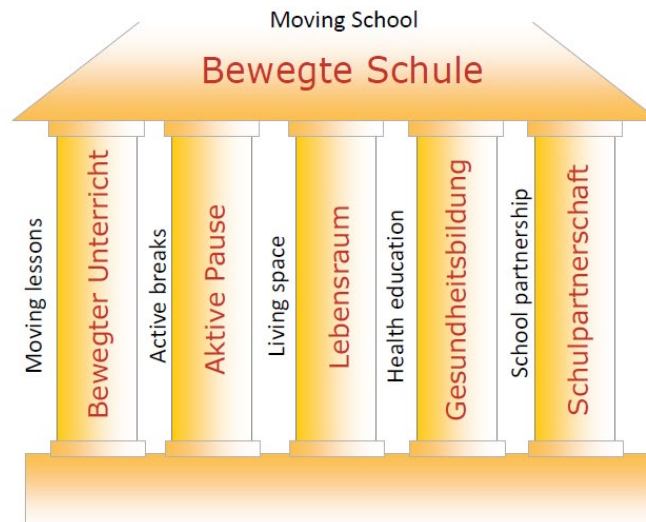
Meetings are ongoing with participants from Austria, Germany and Switzerland. In 2017, members of the Moving School network published the book *Bewegung und Lernen: Konzept und Praxis Bewegter Schulen* in collaboration with Gerold Brägger [6]; in this book, important background information, arguments and practical examples have been compiled.

The development of the Moving School model

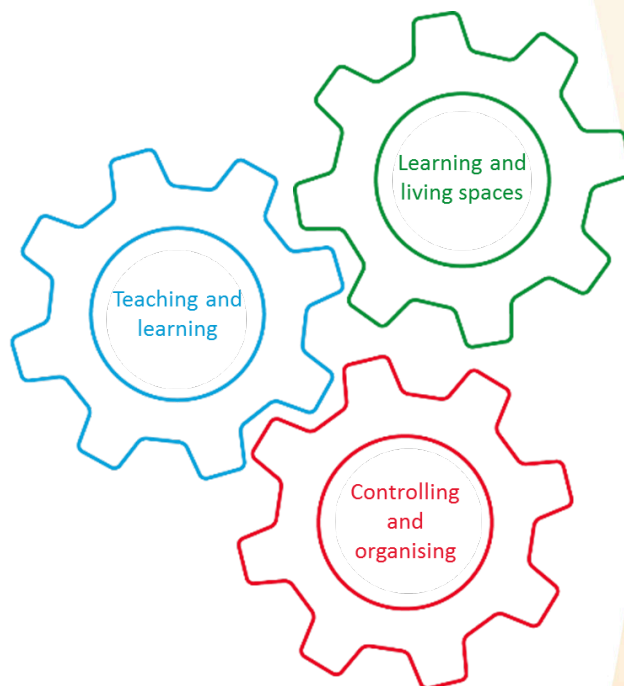


The house model by Klupsch-Sahlmann [7] which was modified by the Upper Austria Moving School team, was the basic concept used to illustrate the Moving School model until 2002. It is important that the children are in the centre and that the blocks surrounding the children are arranged in a way that guarantees the ideal situation for the children's development.

It was subsequently changed to a five-pillar model by Wimmer [8] which was adopted by some federal states in Austria until 2011. The central idea behind the change to a five-pillar model was to simplify the model and involve all the main parts.



The gear model used today from Lower Saxony (Hermann Städtler, Coordination Moving School — Healthy School) was adopted in 2012. It was adapted for Austria and is now used as a school development concept. The decisive advantage of this gear model is that it can be adjusted for every school, is very easy to understand and is very effective in school development [9].



The three fields of activity 'school as a learning and living space', 'teaching and learning' and 'controlling and organising' interlock like gear cogs.

Every change in a gear affects the other two gears and thus influences or changes the whole system. In this context, the trigger can come from any of the individual gear cogs. The approach helps schools in the process of development towards having a Moving School profile, in terms of school development and evaluation. The breakdown of the model into three gears or wheels with cogs is intended to provide teachers with a sense of direction in their efforts to further develop the quality of teaching and the school. It is neither a checklist nor a catalogue of goals, but rather an aid for development towards becoming a Moving School.

The basic idea behind a Moving School is clear. More movement should be involved in the whole system where every person is important. The art of leadership consists of relating them to one another with their individual strengths. Everyone has to find their place in the complex school system and be able to rediscover themselves as a meaningful person in everyday school life. This is easily achieved by the systemic Moving School approach, in which everyone can identify their place in the machinery of everyday school life.

The 'gear model' of the Moving School concept depicts it as a systemic, resource-oriented approach that is based on the existing strengths of each individual. The model of interlocking gears helps schools with their thematic classification of ongoing activities and distribution of work. The use of gears makes it clear that becoming a Moving School depends on all those involved in the school system being interlinked and working together'. The model supports schools in their development towards attaining an active and health-promoting school profile. It is easy to apply and quick to implement. In addition, because it is based on the strengths of the persons involved, it helps clarify the specific roles of all staff. When a school takes stock of its activities, which goes hand in hand with reflecting on individual strengths and needs, the model can help to concentrate considerations on three basic fields of action, i.e. those of the Moving School, into which all of a school's activities can be classified [10].

Reasons for becoming a Moving School

The characteristics of a Moving School are presented below and show that a Moving School is based on a broad foundation.

1. A Moving School takes into account the importance of movement in the development of children and young people

The physical, material and social experiences that are acquired through movement are just as important for personal development as they are for early socialisation. By being exposed to new and interesting movement opportunities, children and adolescents can playfully experience their own movement possibilities, including their limitations and potential to expand their capabilities, become familiar with certain body experiences through movement activities and discover new areas of their environment. With the help of a variety of movement opportunities, they can improve their performance, experience, skills and abilities, and acquire important social skills in negotiating roles and rules through exercise-based games.

2. A Moving School takes a holistic approach to scholastic education seriously

Upbringing and education are seen as holistic processes, which require the harmonious development of mind, soul and body. The body is the ideal starting point to set educational processes in motion. It is the interface between the subject and the world and is therefore of fundamental importance for education. Overall, the idea of the Moving School concept is to make movement an integral part of the general understanding of scholastic upbringing and the educational mandate, and to make life, learning and movement-focused rhythmic teaching overall objectives of schools and obligations for all institutions and people who are responsible for schools.

3. A Moving School promotes the health of pupils and teachers

When one takes into account not only the somatic aspect of health but also the psychological and psychosocial aspects, the importance of movement and sensorimotor perception is revealed through a holistic, relaxing and balancing effect. Movement, games, sport, dance and physical expression, self-

awareness and physical experience balance intense cognitive strain and can help ensure that students feel comfortable by taking their emotional and physical needs into account. Exercise relieves tension, fear and stress after excessive demands, and success in a self-chosen task leads to joy or pride. The opportunity to let off steam, move and play together can teach children and adolescents to treat each other with consideration, to appreciate each other and to get to know other people's strengths and weaknesses. This decreases the likelihood of conflicts and aggression, which in turn will reduce the burden on teachers.

Such effects, however, will not necessarily or automatically arise. Movement is not healthy per se; its health effects depend on how it is done. This includes giving children and young people a joyful approach to exercise and physical experience. This can be achieved by giving students autonomy in choosing physical experiences as often as possible and by offering students the opportunity to take part in physical activities that they find meaningful. School life is an important area for ensuring that children and adolescents have access to such experiences. There are numerous opportunities in school life to try out self-determined action in the area of movement and sensorimotor perception, for instance during breaks, in working groups, on school hikes, and during school trips or parties.

Physical fitness, relaxation, well-being and the feeling of being part of a group are essential prerequisites for meeting the demands of everyday school life. Exercise and relaxation make a major contribution to health and are important building blocks for a good-quality school.

4. A Moving School takes the physical needs and potential of the pupils seriously

Many children and young people today grow up in a heavily mediated world in which primary experience is often neglected and second-hand knowledge is imparted. An oversupply of acoustic and optical stimuli threatens to overwhelm the basic bodily senses. What happens to children and adolescents who are severely restricted in their natural movement needs in class? They send alarm signals. They slide restlessly on the chairs, drum their fingers, rock in their chairs or tap their feet. These behaviours can be even more apparent in children who exercise little in their free time. Behavioural problems such as scuffles with classmates, walking around or screaming can increase and a vicious circle of emotional frustration, physical restlessness and attention disorders is set into motion. Because these children or adolescents receive little sensorimotor stimulation outside school, their nervous systems are often activated intensely or not strongly enough. After a weekend filled with watching videos, fighting with family or peers or playing games all evening, they are often not ready to listen to their teacher and participate in class.

A Moving School finds educational solutions to the aforementioned impoverishment of sensual experiences that plague our children and adolescents. As such, the Moving School approach supports the importance of sensory perception and physical movement for a holistic education and upbringing.

5. A Moving School promotes well-being and a willingness to learn and perform

Good schools offer exercise programmes that are integrated into everyday school life and provide numerous incentives for the specific age group. School should be considered a living space and a place for movement and play. The connections between exercise and well-being are manifold, especially those between well-being and joy.

According to neurobiological findings, exercise increases blood flow to the brain, promotes the formation of new connections and consolidates existing knowledge. It has been found that movement engages special brain centres, which directly communicate with the language centre and the working memory. The latter serves as a buffer when acquiring knowledge. These areas generally have better blood supply when an individual exercises. Dopamine is used as a messenger substance for the coordination of movements; it is an endogenous substance that activates our working memory and stimulates our motivation.

The most effective way to improve executive functions¹ and academic achievement is not to focus solely on these measures of success, but to also address children's emotional, social and physical development needs (11).

6. A Moving School promotes a new learning culture through an 'educational architecture'

Nowadays, schools tend to shift towards 'moving learning landscapes' in which guided learning and direct instruction, self-discovery, research-based learning, development and practice phases, and individual work and teamwork alternate. This gives relationships between peers new weight. Preschool and school buildings must incorporate these goals to promote development. The development of a competence culture requires different learning arrangements than used previously and thus requires changes in school and room compositions. The school architecture must be brought into line with the 'educational architecture' and the new learning culture must be challenged.

The aim of the concept of new learning is to develop a competence culture in which learners act actively and learn in a moving manner. Pupils should increasingly plan their learning paths themselves, take action themselves, take responsibility for their own learning and reflect on their learning processes to be able to take responsibility for shaping their own lives in a responsible and competent manner. Students will develop these tools gradually through lived experiences and the consequences of their own actions.

The pedagogical architecture of the Moving School supports and promotes diverse forms of independent and moving learning. A Moving School is designed as a space for learning, experience and movement.

7. A Moving School is a key element of competence and action-oriented teaching

Motivation and competencies for lifelong learning are promoted in forms of teaching that enable independent and action-oriented learning in which children and young people can take responsibility for their actions and deal with the consequences. Learning situations that are accompanied but not dominated by the teacher enable students to realise that they can make a difference, solve problems in their own environment and achieve goals on their own.

Movement is a fundamental part of action-based learning. Technical and interdisciplinary skills can be acquired in concrete, application-oriented activities. Therefore, the Moving School approach can be considered a supporting element of competence and action-oriented teaching.

8. A Moving School makes an important contribution to the development of quality in schools

Movement and sensorimotor perception are not the only things that have an indirect impact on the quality of a child's development. The school climate also has a significant influence on a school's quality, and the opportunities for exercise in turn contribute to an advantageous school climate.

The quality of an educational establishment, as represented by the school, is primarily measured by the effectiveness of its learning and educational processes. Movement and sensorimotor perception have been shown to contribute to the effectiveness of school learning and educational processes.

9. A Moving School strengthens the cooperation between teachers

Increased cooperation between teachers leads to changes in schools, with benefits becoming apparent when teachers learn from the experiences and routines of their colleagues. In this way, different cultures of movement will develop in schools. In one school, active learning is practised in all classrooms; in another school, various movement stimuli are provided by teachers and pupils; a third school creates

¹ The executive functions (EFs) of inhibitory control, working memory and cognitive flexibility enable us to think before we act, resist temptations or impulsive reactions, stay focused, reason, problem solve, flexibly adjust to changed demands or priorities, and see things from new and different perspectives. These skills are critical for success in all aspects of life and are sometimes more predictive than even IQ or socioeconomic status (Diamond, 2016).

movement and relaxation spaces for teachers; and another school offers physical activity during breaks. Cultures can be neither prescribed nor copied; they have to develop individually in schools.

10. A Moving School is a good, healthy school

Movement and physical awareness are central components of school health promotion and prevention. Physical activity has a high impact on both physical and mental health. Movement and sensorimotor experiences can be part of sustainable, effective health promotion and prevention only if they permeate the school as a whole and change its character, and only if they are not the concern of only individuals but of the entire school community and are structurally anchored. Such lasting effects are possible only if, on the one hand, all decisions are made from a health perspective and, on the other hand, the continuous and targeted development and improvement in quality of the entire school are shaped through health-related interventions.

Implementation of the Moving School concept in Austria

Good practice school

The idea of the Moving School has spread widely through the development of 'Good (Best) Practice Schools', which attracted the attention of other schools leading to them adopting some aspects.

These schools are also shown separately on the homepage of Moving School Austria. Furthermore, they are visited by trainee students and by active teachers so that these ideas can be spread further.

A detailed description of some schools can be found here:

<https://www.bewegteschule.at/praxis/good-practice/>

Seal of quality

Moving School Austria awards a seal of quality to those schools that have included physical activity as an important part of school life in their school profile and in regular operations.

The three-part seal of quality is a recognition of permanent school development, as required by the Ministry of Education for quality development. The seal of quality is awarded for 3 years, after which the schools need to be re-evaluated for this certification.

The seal of quality is not considered an indication of a completed process; instead, it is intended to indicate the current state of development. Consequently, the school is able to assess in which areas there are still opportunities for further development, which it can then address before the next evaluation process.

The evaluation is not carried out centrally. We assume a positive attitude and readiness for development from the school and also want to present its activities on our website. In doing so, all teachers, parents and students have the opportunity to see how physically active the school is. Because we have managed to make 'Moving School' a well-known term over the last few decades, a lot of schools want the seal of quality.

A total of 549 schools have currently achieved the seal of quality in Austria. Of these, 53 schools have reached the highest level, level III, 234 have reached level II and 262 have reached level I.

All schools and their projects and fields, which are implemented can be accessed via our website.

<https://www.bewegteschule.at/guetesiegel/>

In-school teacher training (4 to 12 units)

For the development of Moving Schools, teacher training at different school locations has proven its worth. We have developed various programmes in Austria over the past few years and in doing so we have collaborated with social insurance companies. Schools can focus on either active breaks or moving learning.

First, the school should complete a basic module on the subject of the Moving School successfully, in which the advantages and benefits for teachers and students are pointed out. In doing so, the teachers learn individual exercises for moving learning as well as for active breaks.

In-school teacher training is primarily based on primary schools and takes an afternoon, during which examples for the various subjects are presented. It must be noted, however, that in Austria the teachers teach all subjects in elementary school and therefore a wide range of further training is given. Advanced teacher training courses, which can be booked individually, are then offered to deepen the knowledge acquired every year.

We offer two individual training sessions on active breaks in conjunction with social security organisations, as they have the ability to finance speakers for the schools. In this process, headmasters are informed and trained first and then all the teachers get involved. The training can be completed over several months.

However, it is also possible to attend an informative afternoon on this topic. In this case, the school itself is more responsible for the implementation and the process.

Teacher training (4 to 8 units)

The teacher training courses are mostly aimed directly at implementation of the Moving School approach in the individual lessons and thus on moving learning and methodical approaches that stimulate more movement in the classroom. In elementary school, this is designed for several different subjects and in secondary school for specific subjects. Most training modules were designed for the subjects German, English and mathematics. Geography and economics were recently added as well.

From 2010 to 2012, so-called trigger events to promote the Moving School concept were offered, especially at secondary level, as this topic was still new at this level, and attempts have been made to point out the impact, importance and potential of the Moving School approach. Many participants of the training have since tried to implement different aspects of the approach in their own schools.

Courses (extra-occupational training — 1 year or more; around 100 units)

These courses are aimed at people who want to deal more intensively with the topic and consequently want to act as multipliers in their own school, in the region or in the state. Many of those who have undertaken the courses are employed as speakers at further training sessions in schools. These courses were offered at national level and by some federal states.

All aspects of the Moving School concept are conveyed to the participants through theory and practice in these courses.

The various aspects covered are:

- schools as learning and living spaces, such as ergonomics of the classrooms, school grounds and outdoor spaces, nutrition, risk and school climate;
- teaching and learning; movement impulses in lessons and moving lessons (learning in and through movement);
- controlling and organisation; child- and teacher-friendly rhythmisation of everyday school life under the aspect of daily rhythm and sleep research; creation of a pleasant learning and working environment for pupils, teachers and everyone involved in the school, by designing the school to be a positive living space for positive experiences.

Interpädagogica (Austrian education fair)

For several years now, the Moving School concept has been represented by a fair stand at Interpädagogica, the largest education fair in Austria. Up to 600 teachers can be reached at this fair and are provided with folders, teaching materials and a link to the Moving School homepage. Lectures and workshops on various aspects of the Moving School approach are also held at this fair.

Austrian Moving School Network— networks in the federal states

The federal state network is important for the further development of the Moving School initiative. This involves one or two people from each federal state meeting regularly to discuss the further development. In addition, each federal state has a steering group that discusses developments and measures, which are then implemented in the respective federal state.

The Austria-wide Moving School Network, which is organised by the Department of Sport, Exercise and Health of the University of Education of Upper Austria stays also in touch with the ministries, the regional education administration and other important partners.

The Moving School approach and impacts on lifelong health

Throughout the last decades, the worldwide prevalence of non-communicable diseases, including obesity, has increased dramatically. Many of these diseases have their origins in childhood and persist as health burdens throughout adulthood.

In examining this critical health challenge, it has become clear that increased physical activity must be an essential part of any solution. Clearly, the earlier in life this important health behaviour can be ingrained, the greater the impact it will have on lifelong health. In an increasingly sedentary world, schools therefore provide the best opportunity for a population-based approach for increasing physical activity (12).

Health benefits of moderate-to-vigorous physical activity in children include a reduction in adipose tissue, increased physical fitness levels, improved cognitive performance and a reduction in the risk of comorbidities such as cancer, cardiovascular disease and obesity in adolescence and adulthood.

Sitting behaviour established in childhood and adolescence is often retained in adulthood (13). More sitting time during work often results in musculoskeletal health problems, especially low back pain and neck and shoulder complaints (14).

Numerous adaptations can be made to workplaces to prevent MSDs, but the most effective way is to start early and promote a more physically active lifestyle in childhood.

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