

The Positive Effects of Active Mobility on Health with a Focus on Children's and Youth Mobility

Stefanie Blank, Natasa Hodzic-Srndic, Julia Kammer

(DI Stefanie Blank, AustriaTech, Raimundgasse 1, 1020 Wien, stefanie.blank@austriatech.at)

(DI Natasa Hodzic-Srndic, AustriaTech, Raimundgasse 1, 1020 Wien, natasa.hodzic-srndic@austriatech.at)

(BSc, Julia Kammer, AustriaTech, Raimundgasse 1, 1020 Wien, julia.kammer@austriatech.at)

1 ABSTRACT

The "Health Targets Austria" from 2012 define, among other things, an increase in healthy life years in Austria. These are the years of our lives that we do not spend in illness. According to Eurostat, the average EU citizen over the age of 65 still has 10.3 healthy years of life. In comparison, Austria has only 7.7 healthy years. Now, a report by the Austrian Court of Audit has criticized the fact that this target has not been met because the number of healthy years of life from the age of 65 is falling significantly despite various measures that have been taken to date. Healthy life years are closely related to a lack of physical activity. The World Health Organization (WHO) recommends 150 minutes of moderately intensive exercise per week. In Austria, only about half of adults meet these recommendations. According to the WHO, children and adolescents between the ages of 5 and 17 should engage in at least 60 minutes of moderate to vigorous physical activity daily.

Encouraging in active mobility during young ages holds tremendous potential for preventing later diseases associated with physical inactivity. In Austria, one of the most frequent causes of death are cardiovascular diseases. These are closely linked to a lack of physical activity. Research shows, the positive effects on personal health are a decisive motivator to achieve a lasting change in behaviour towards active mobility. Sufficient physical activity in old age has an enormous impact on extending "quality years" and can help prevent dementia. In addition, active mobility prevents obesity, osteoporosis and various types of cancer. Active mobility thus also reduces the likelihood of belonging to one of the risk groups mentioned above.

In addition, the developments in the choice of means of transport in recent decades from active mobility to passive jeopardize the promotion of active forms of mobility. Especially the increase of so-called "parent cabs" and the reduction of free play in the residential environment due to the increased traffic volume contribute to this. The increased traffic volume also causes a higher health burden due to noise and pollutants.

Among the factors that can influence health is physical activity, which has a positive effect on the physical and psychological development of children and adolescents. As an area of physical activity, active mobility also plays an important role alongside sport in achieving a health effect. Active mobility in everyday life (walking or cycling) is the key to changing this.

Active mobility is also conducive to healthy sleep patterns (sufficient sleep and quality of sleep) and subsequently has a positive effect on subjectively perceived well-being and stress levels. Other positive effects of active mobility include a better attention span compared to peers with little to no physical activity. This also results in better school performance among children and adolescents who are physically active. These are just a few reasons why it is important to promote active forms of mobility among children and adolescents.

Keywords: physical activity, adolescents, children, health, active mobility

2 POSITIVE EFFECTS OF ACTIVE MOBILITY ON HEALTH

Active mobility significantly contributes to several of Austria's health goals such as creating health-promoting living and working conditions (Health Goal 1), enhancing health literacy (Health Goal 3) as people become more aware of the health benefits associated with mobility. Furthermore, active mobility, when pursued collectively (e.g. Pedibuses), foster social cohesion which in turn strengthens health (Health Goal 5). More general, active mobility plays a crucial role in providing a healthy upbringing for children and adolescents (Health Goal 6). Another essential aspect is promoting safe and healthy movement in daily life (Health Goal 8). In addition, encouraging children to explore their surroundings and experience things actively rather than relying on passive transportation also fosters psychosocial health (Health Goal 9). These factors highlight the value of active mobility in achieving Austria's health goals while co-creating a health-promoting and socially supportive environment. (BMGF, 2017)

2.1 Physical health

In Austria, one of the most frequent causes of death are cardiovascular diseases. These are closely linked to a lack of physical activity. Research shows, the positive effects on personal health are a decisive motivator to achieve a lasting change in behaviour towards active mobility. Sufficient physical activity prevents obesity, osteoporosis and various types of cancer. According to the World Health Organization (WHO), obesity is considered a disease and the WHO even speaks of a global epidemic of the 21st century. Obesity can lead to a number of secondary diseases: In addition to psychological consequences, shortness of breath an increased risk of high blood pressure and cardiovascular diseases, an increase in the probability of strokes and an increased risk of diabetes are possible effects (Voitl, 2004).

According to statistics, Austria is in line with the Central European trend in terms of overweight among children and adolescents. One in four adolescents is classified as overweight and just under nine percent as obese. The strong rates of increase over the observed period are particularly drastic. (The Lancet, 2017)

Everyday trips in particular can often be done by bike or on foot, and at little cost. Studies show that the positive effects on personal health are a decisive motivator for a lasting change in behavior toward active mobility. In addition, active mobility prevents obesity, osteoporosis and various types of cancer. According to Statistics Austria, one in four adolescents in Austria is overweight and almost nine percent are already obese. Habits learned in childhood and adolescence are usually maintained into adulthood. (Lohaus, 1993) This transfer of behavior is also known as the tracking effect. Thus, the literature also indicates that physical inactivity in childhood is also highly likely to lead to an inactive lifestyle in adulthood. (Völker, 2008)

As an area of physical activity, active mobility, along with sports, also plays an important role in achieving a health effect.

The development of transport mode choice in recent decades from active mobility to passive (MIV) puts a particularly heavy burden on children. In one of his studies (Children's travel behavior and its health implications), Mackett (2013) investigated the positive effect of an actively completed walk to school on the consumption of calories and contrasted this with a usual physical education class (2 hours per week). Older children aged 12 to 13 years burned more calories walking to and from school than during physical education classes. This indicates a physical activity advantage to walking (Mackett, 2013).

It was also shown that the positive effect of active walking to school could not only be attributed to the activity itself (walking versus driving), but positive effects were also found later in the day. For example, children who walked to school behaved more energetically across all subsequent activities than children who were taken by car. This effect could be observed not only on the way to school, but also on the modal split over the entire daily life of the children.

However, walking or biking actively to school and gym time at school cannot be compensated by any extracurricular behaviors. Yet, considering that children and adolescents cover a defined route during 40 school weeks and 200 days per year while commuting to school, the cumulative duration of these active or inactive periods of movement becomes substantial (Schneider 2012). Therefore, it is imperative not to underestimate the significance of these additional activities in promoting overall physical activity levels, as mentioned by Goodman et al. (2011).

2.2 Mental health

Active mobility also promotes healthy sleep patterns (sufficient sleep and quality of sleep), which in turn has a positive effect on perceived well-being and stress levels. A study with 152 primary school children in lower Austria shows a tendency how parents could observe that their children slept better, if their level of active mobility during the day was higher. On the other hand it showed, that children who moved by car during the day, were more irritated and had a tendency of an inner restlessness (Stark et al. 2018). Particular the connection with the aspect of well being, their health status and a good night sleep Schneider 2012 shows in her study that a certain tiredness has an affect on children's self consciousness (Schneider 2012).

Furthermore, active mobility helps to counteract diseases. It also reduces Alzheimer's disease and dementia. Another positive effect is the reduction of risk for depression and anxiety.

It is clear that mobility influences children's psychological well-being at different levels, both in the short term (via direct experience and activation on the route itself) and in the long term (e.g. as a result of traffic

accidents). Even though a predominant part of the influences on well-being is based on the external influence of traffic (traffic noise and accidents), the results indicate that the choice of means of transport additionally influences the psychological cognitive and social domain.

2.3 Cognitive and social skills

Active mobility has a positive effect on the attention span as well. Compared to peers with little or no physical activity the attention span is better. Physically active children and adolescents also perform better in school. Another positive aspect is the independence and the children have more social contacts. For instance, engaging in a pedibus, a joint walking initiative, offers numerous opportunities to fortify social bonds among children and adolescents, which in turn yields a wealth of profound health advantages. Social interactions at a young age play a pivotal role in shaping cognitive, emotional, and physical development, and walking together in a pedibus setting fosters an environment conducive to these beneficial connections (e.g. it combats feelings of loneliness, promotes a sense of belonging, enables to share experiences and a sense of teamwork which in turn fosters resilience).

3 CURRENT PHYSICAL ACTIVITY SITUATION OF CHILDREN IN AUSTRIA

The World Health Organization (WHO) recommends 150 minutes of moderately intensive exercise per week. In Austria, only about half of adults meet these recommendations. According to the WHO, children and adolescents between the ages of 5 and 17 should engage in at least 60 minutes of moderate to vigorous physical activity daily. (WHO, 2010)

A common measure to describe a burden of disease and its impact on the duration and quality of life is the DALY (Disability-adjusted life years) defined by the WHO. A DALY corresponds to the value of a lost "healthy" year of life resulting from the current state of health compared to an ideal situation (WHO, 2009). Across Austria, it is assumed that the risk factor physical inactivity is responsible for 6% of all deaths and for 3% of all DALYs. Risk factors and diseases are interrelated and are therefore included with different proportions in the total DALY burden. A healthy lifestyle as a preventive measure against the major risk factors of high blood pressure, tobacco and alcohol consumption, high cholesterol, overweight and obesity, too few fruits or vegetables, and physical inactivity can largely prevent diseases and leads to a reduction of the DALY burden by almost 30% (WHO, 2005).

Sedentary behavior among children and adolescents has been shown to have a negative impact on health. It can be assumed that the sedentary lifestyle contributes to the development of obesity. (Huber & Köppel, 2017). This study, which covers Germany, Luxembourg, and Austria, shows that the median sitting time of children and young adults aged 4 to 20 years is 10.6 hours on weekdays and 7.5 hours on weekend days. This is particularly alarming because at the same time it is shown that long sitting times of more than 8 hours have massive health effects and are associated with the risk of premature death. Furthermore, significant correlations between sitting times and the prevalence of many chronic diseases are shown, with the increased prevalence of obesity in adolescents still insufficiently researched.

3.1 Independent mobility among children as driver for active mobility

Regarding active mobility another term to put in connection is independent mobility of children. Independent mobility means that children are able to move in the residential environment without the accompaniment of an adult (Hillman et al. 1990 quoted after Seemüller et al.). The ability to manage schoolways independently is an component which influences the mobility behaviour of children in the long run. There is a tendency that independent and active trips of children can be associated with an increased physical activity (Oliver et al. 2016). Larouche et al. got an similar result: independent trips of children support physical activity (Larouche et al.). Furthermore independent mobility can contribute to the well being of children. There are first results which are indicating a positive correlation (Stark et al. 2018). However, there is no causality to report here and in general the field of psychological well-being in connection with mobility is still a rather unexplored area. Although it is known that independent mobility can have a positive impact on the mobility behaviour of children regarding active mobility the amount of children which are independent mobile is decreasing. In Germany the number was decreasing from 93% to 76% during the years 1990 and 2010 (Shaw et al. 2013).

What steps are to be taken now to ensure that children are moving more actively and independently? There are different needs to consider. On the one hand regarding children's needs in particular – an individual factor

– and on the other there are factors from outside which have an effect on children: the social environment and infrastructure conditions.

3.2 Factors influencing the mobility of children

Figure 1 shows that the factors, which can influence the mobility behaviour of children is very diverse. An important factor is the infrastructure. To build and shape infrastructure in a way people and especially children are able to be mobile in a safe and independent way is one goal. Another important aspect is to build awareness and knowledge. Especially regarding new mobility services such as e-bikes and e-scooters.

In the study from Seemüller et al. is described which individual factors affect the urge to use active mobility. For the children motivation and personal attitude are beneficial. Nevertheless, a lack of knowledge about road traffic conditions could have a negative effect (Seemüller et al. 2022). Regarding this result safety is an important topic for children, which is also shown in the study from Landwehr and Kolip 2021 (Landwehr & Kolip 2021). This can be correlated if the outside factor infrastructure. If traffic infrastructure is designed poorly, it effects safety of children and their well-being regarding everyday ways (Seemüller et al. 2022, Landwehr & Kolip 2021). In addition, to consider is, as mentioned earlier, the outside factor social environment. Regarding children, it is their parents, which make up a large share of their social environment. Children want to be mobile in an independent way (Seemüller et al. 2022). Often their parents are concerned, and it is important to consider them, when talking about mobility during children. Needs of this particular target group are diverse and merge into eachother.

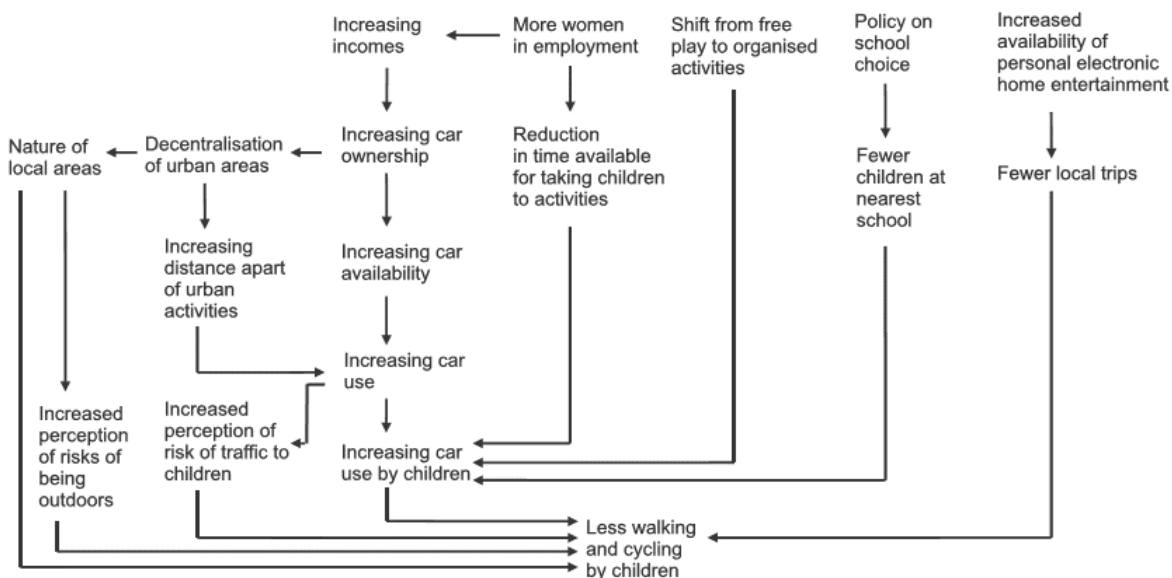


Figure 1: The influence of modern life on children's walking and cycling levels (Mackett, 2013, S. 68).

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4 CONCLUSION

Active mobility and health are closely linked and play an important role for the development of children and adolescents. Different studies already showed that there is a positive correlation between active mobility and

health. Unfortunately the exercise recommendations are already not achieved and the trend does not seem to change soon either. Active mobility in everyday life (walking or cycling) is one key to change this.

If we want to change the travel behaviour towards more active mobility, it is necessary to start with the children.

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