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PHYSICAL ACTIVITY DURING COVID-19 PANDEMIC LOCKDOWNS IN GERMANY – AN OVERVIEW

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Summary: In Germany, different ministries are responsible at state level for sport and physical education. The same applies for Covid-19 pandemic decrees. As a result, different rules and regulations have to be followed depending on the place of residence. The same applies to regulations of physical activity in various settings – kindergarten, school, clubs, municipality. The periods of Covid-19 lockdowns have been marked by nationwide closures of kindergartens, schools and in- and outdoor sport facilities. Resulting in an increase in screen time and sedentary activities (Langmeyer et al. 2020) and a notable decrease in children's daily physical activity to 23.9 minutes (Schmidt et al. 2020). However, during the first lockdown (22. 03. 2020 – 04. 05. 2020), participation in daily activity increased from 108.8 min. per day before the pandemic to 146.8 minutes per day (Schmidt et al. 2021). This development in more casual sporting activities was not sustained into the second lockdown. Daily activity decreased to 62.2 minutes per day (Schmidt et al. 2021). Only organized sport showed a slight increase from 0.0 to 3.7 minutes per day in lockdown two (Schmidt et al. 2021). This was in spite of the fact that high-level athletes were allowed to train and some sport clubs changed to online offerings.

Key words: children, adolescents, Covid-19 Pandemic, Lockdown 1, Lockdown 2, physical activity, habitual physical activity

Introduction

Following the declaration of Covid-19 pandemic as a global pandemic by the World Health Organization in March 2020 (WHO, 2020), Germany reacted to the increasing numbers of infected people with two nation-wide lockdowns to stop the spreading of the virus: The first lockdown took place from the 22nd March, 2020 until the 4th May, 2020. A second lockdown followed in November 2020 (2nd Oct.,2020) divided into a "hard" lockdown (until 16th

December, 2020) and a “light” lockdown (till 31st May, 2021) (Imöhl & Ivanov 2021). Closed schools, kindergartens, and sport facilities, homeschooling and mandated telework reflect the picture of the hard lockdown. Public life was put on hold. Germany is made up of 16 largely autonomous federated states, with a central government responsible for more national decisions. Although broader pandemic policies were set at a national level, the regulations for managing both lockdowns were mainly regulated at state level. As a result, Germany had 16 different sets of Covid-19 pandemic restrictions during the lockdowns.

In addition, each state has a different infrastructure for the management of physical activities, health-related or high-level sports and physical education. For example, in North Rhine-Westphalia (NRW) the Ministry for Children, Families, Migrants and Integration is responsible for sport, while in Baden-Wuerttemberg the Ministry for Culture, Youth and Sport is responsible for sport. Physical education is also often organized differently. Usually, physical education is regulated by ministry for education, on the basis that it belongs to the work of schools. When combined with Covid-19 pandemic regulations, this often means that the same child has to act differently depending on the (sports related) setting it is in. The focus of this review is the physical activity of children and adolescents in Germany during the lockdown periods.

Newspaper article headlines such as “How much children suffer from the lockdown” (Windmann 2021) or “Physical inactivity pandemic – Impact of the lockdown on children’s physical activity behavior” (N.N. 2021) drew attention to the long-term consequences of pandemic regulations for children. The conclusions reached by the journalists in these articles, were largely based on the national study for health in children and adolescents in Germany (KiGGS-study) run by the Robert Koch-Institut. As part of KiGGs, physical activity has been scientifically evaluated in long-term studies of the Motorik-Modul-study (MoMo). The outcome of the MoMo study forms an important part of this paper as it was the first to specifically survey the physical activity of children and adolescents during both lockdowns in Germany.

Methods

To identify studies, which focus on physical activity of children and adolescents in Germany, Web of Science, Pubmed and BISp Surf were screened for articles. The search terms “physical activity AND children OR adolescents AND Germany” were used in both English and German languages depending on the database being queried. After screening the articles, six articles focused on the topic or had some content related to the topic. The following three

out of six studies have specifically surveyed the physical activity of children and adolescents in Germany:

- Physical activity and screen time of children and adolescents before and during the COVID-19 lockdown in Germany: a natural experiment.
- Zur Situation der körperlich-sportlichen Aktivität von Kindern und Jugendlichen während der COVID-19 Pandemie in Deutschland: Die Motorik-Modul Studie (MoMo).
- The Impact of COVID-19 on the Interrelations of Physical Activity, Screen Time and Health-Related Quality of Life in Children and Adolescents in Germany: Results of the Motorik-Modul Study.

The three additional studies dealt with the impact of the lockdown situation on children and adolescents in Germany in general. The methods of the MoMo-study (MoMo = motoric module) will be briefly introduced at this point, because the three studies referenced relied on the Mo-Mo study for the data gathered during lockdown one and lockdown two.

MoMo is a cohort sequence designed longitudinal study with a representative sample of kids aged four to seventeen years tested at 167 different places in Germany (fig. 1) (Schmidt et al. 2021). Wave one of MoMo started 2003 till 2006, the second was from 2009 till 2012, the third started 2014 till 2017 and the fourth was planned and realized from 2018 till 2021 and covered the time of lockdown (Schmidt et al. 2021).

Figure 1
Locations of data acquisition by the MoMo-Study (motorik-modul.de 2021)

Beneath the questionnaires to detect physical activity, answered partly by parents because of the age of the children, a motoric investigation of a trained external test team are

used to collect data on sport and physical activity behavior, to health-related behaviors and to collect data to coordination, strength, flexibility, balance and reaction (Schmidt et al. 2021). For wave four, which began in 2018 and covered the period during the pandemic, the data gathering procedures had to be changed as the pandemic meant that there were limited possibilities to test children and adolescents in person (Badische Turnzeitung 2021). Instead, a specific online questionnaire had to be designed (Schmidt et al. 2021), and the testing of motoric abilities by an external test team was paused.

The first online survey was carried out in 2020 from April 20th till May 1st with 1.717 participants (Schmidt et al. 2021). The second online survey ran in 2021 from January 29th till February 14th and was within the period of the second lockdown (Schmidt et al. 2021). 1.322 participants answered the questionnaire. Figure two visualizes a timeline, which shows events due to the pandemic and the survey context of the first lockdown (Schmidt et al. 2020).

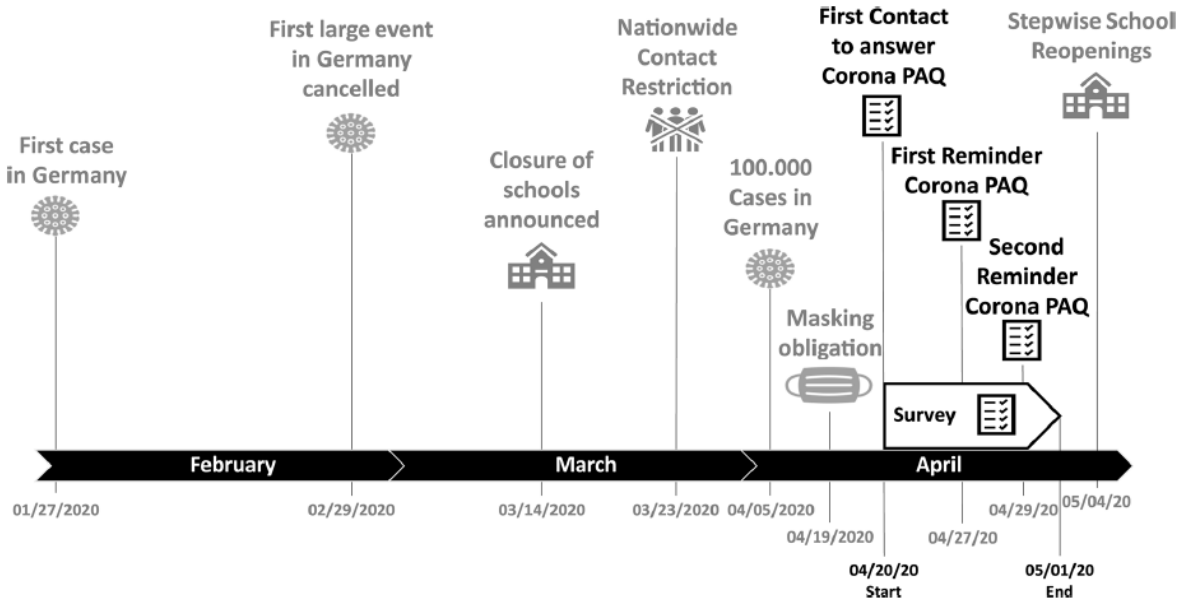

Figure 2

Timeline of events and survey context during the COVID-19 lockdown Germany (Schmidt et al. 2020, p.9)

The online questionnaire – to mention it again – is based on self-reporting exclusively. Self-reporting may lead to other results than combining a questionnaire with the results of an external test team.

Results

Physical activity has to be clearly defined, especially if it relates to data provided by a questionnaire, answered by children, adolescents and – in some cases – by parents. Physical activity is in this case mostly defined as every skeletal muscle activity, which leads to an

increase of energy consumption (Caspersen, Powell & Christenson 1985). To determine changes in physical activity behaviors as a result of the pandemic, it is first necessary to describe the physical activity behavior before the pandemic. The evaluation of physical activity is guided by the WHO recommendation of 60 minutes per day of moderate-intense physical activity (WHO 2020). With reference to the WHO recommendations in the years 2018 till 2020, 18.1 % of children and adolescents aged four to seventeen years in Germany reached 60 minutes of physical activity per day. Based on previous research studies the authors note that, since the first results published in 2003 (25.1 %), fewer children reach the WHO recommendations (Schmidt et al. 2021). The study by the HBSC-Studienverbund (2015; 2020) show similar results. Following on from school closures and the elimination of organized sports, it can be assumed that even fewer children and adolescents will reach WHO recommendations during Covid-19-Lockdown.

However, Schmidt et al. (2021) demonstrated that, contrary to the assumptions based on the previous downward trend, during lockdown one more children and adolescents (4 - 17 years) undertook 60 minutes per day moderate-intense activities. Despite the absence of organized sports and activities, the percentage increased instead of decreasing (Schmidt et al. 2020). Casual sport such as for example, playing soccer in the garden, actually increased (Schmidt et al. 2020). Nonetheless the overall amount of sports activity decreased in total by 10.8 minutes per day (Schmidt et al. 2020). There is still no explanation for the 31,5 % of guideline fulfillment in lockdown one. This requires a closer look at habitual physical activity. Habitual physical activity is characterized by playing outside, walking and cycling, gardening and housework (Schmidt et al. 2020). In lockdown one, the total amount of habitual physical activity increased by 36.2 minutes per day (Schmidt et al. 2020). The following figure shows differences in time spent doing sports activities, habitual physical activity and recreational screen time. The differences in time relate to time spent before the pandemic in comparison to time spent during lockdown one.

According to the HSBC-Studienverbund, prior to the pandemic the level of physical activity of children and adolescents in Germany was already low (HSBC-Studienverbund, 2015; 2020). For a healthy upbringing – which includes also physical activity– we have to have a look at all leisure time activities and the impact of the lockdown situation on children and adolescents in Germany in general (e.g. Langmeyer et al. 2020). Overall, it was noted that German children and adolescents watched more TV, played more board games, listened more to music or played music during lockdown one (Langmeyer et al. 2020). Younger children did more crafts and older ones spent more time on social media (Langmeyer et al. 2020). Moreover,

the influence of their environment had an impact on how the children and adolescents surveyed in the studies spent their leisure time. For example, 44 % of children living in rural areas played outdoors (Langmeyer et al. 2020). On the other hand, only 31 % of children living in larger urban areas played outside (Langmeyer et al. 2020), not least due to the fact that there is less space available to play outside in a safe environment. 59 % of urban children stated that they watched more TV (Langmeyer et al. 2020) whereas only 52 % of children from rural areas indicated watching more TV during the lockdown one (Langmeyer et al. 2020). It is observable that while children and adolescents spent more time in front of screens, as noted by Schmidt and colleagues (2020) (fig.3), habitual physical activity also increased.

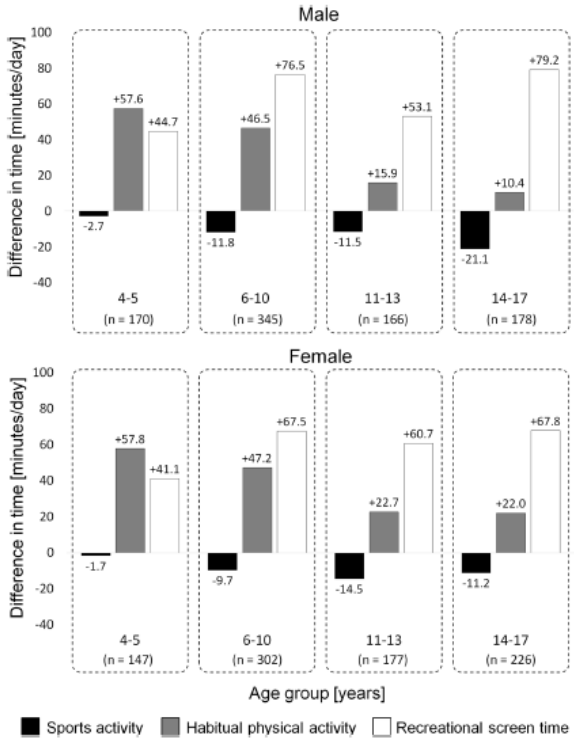

Figure 3

Differences for total amount of sports, habitual physical activity, and recreational screen time among youth in Germany pre and during the Covid-19 lockdown (MoMo study) (Schmidt et al. 2020, p. 3)

It is important to note the effects of the pandemic and lockdown on children's mental and psychological health also. The COPSY-Study Ravens-Sieberer et al. (2021) study showed that 70.7 % of the children and adolescents surveyed felt burdened of the pandemic and lockdown. This stress exacerbated by home schooling, which meant less contact to friends (Ravens-Sieberer et al. 2021). Accordingly, it is not surprising that the quality of life for children and adolescents has deteriorated with the corresponding decrease in health-related life .quality (Ravens-Sieberer 2021; Wunsch et al. 2021). Wunsch et al. (2021) identifies less physical activity and increased screen time as main factors, which have negative influence on

the health-related quality of life. Anxiety among children and adolescents also increased significantly compared to before the pandemic (Ravens-Sieberer 2021). When one looks at changes between the first and the second lockdown, it is important to take into consideration that the quality of the two lockdowns were different and that people might have adapted to limitations during pandemic situations.

The percentage of children and adolescents meeting WHO physical activity recommendations could not be sustained through the second lockdown (Schmidt et al. 2021). Only 16.2 % of children and adolescents (4 - 17 years) met the WHO-guidelines (Schmidt et al. 2021). Without the additional facilities offered by sports clubs or by physical education in schools, the percentage drops beyond the value even before the pandemic (Schmidt et al. 2021). Physical activity could not be increased in the long term (Schmidt et al. 2021).

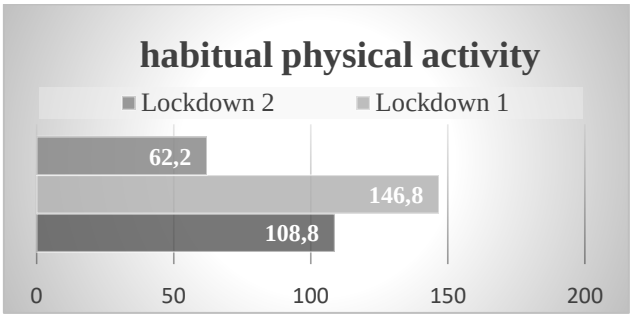

Figure 4
MoMo-key figures "habitual physical activity" to the pandemic average minutes per day (according to Schmidt et al. 2021, p. 13)

Moreover, habitual physical activity decreased from 146,8 minutes per day during lockdown one to 62,2 minutes per day during lockdown two (Schmidt et al. 2021). Sporting activities – see numbers for the organized sport as one possibility below – decreased by 60 % in lockdown two (Schmidt et al. 2021).

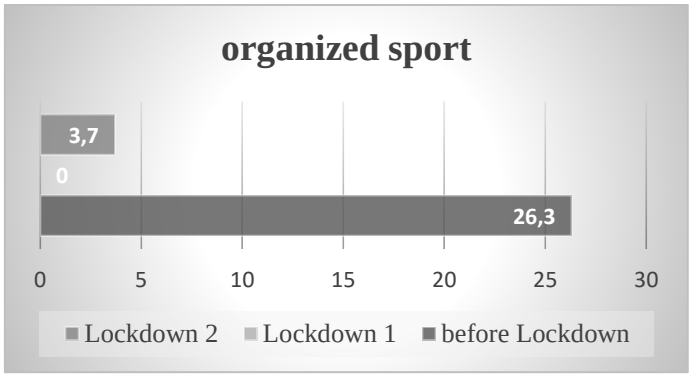

Figure 6
MoMo-key figures "organized sport" to the pandemic average minutes per day (according to Schmidt et al. 2021, p. 13)

As mentioned in the introduction, physical activity was already at a worrisomely low level before the pandemic. Schmidt et al. (2021) and Ravens-Sieberer et al. (2021) declare the lack of motivation to be one cause of the decrease in physical activity. On the contrary, the use of digital media in leisure time increased to a total of 227.5 minutes per day in lockdown two. As Langmeyer et al. (2020) already identified in lockdown one, there is a shift in leisure activities which continued to be observed in lockdown two.

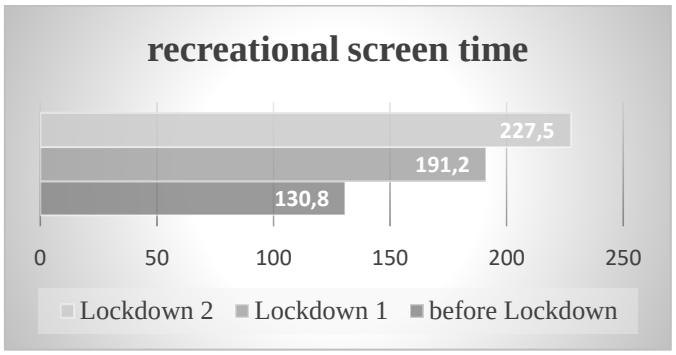

Figure 7
MoMo-key figures "recreational screen time" to the pandemic average minutes per day (according to Schmidt et al. 2021, p. 13)

Environmental possibilities to be physically active were no longer existent or redefined. However, the pandemic seems to have been a facilitator for creating new means for physical activities. As a result of homeschooling, habitual physical activities such as the walk or cycle to school (or kindergarten) no longer belonged to the daily routine. In certain cases, gyms, which are regularly used for physical education in schools or kindergarten, have been transformed into vaccination centers (Kuhlmann 2021; Bundesministerium für Gesundheit 2021). Hygienic regulations declared to manage the pandemic make it complicated to be physically active even in outdoor spaces or to perform physical education (Kuhlmann 2021). However, instead of this resulting in physical education lessons being cancelled or put on hold, a number of organizations designed alternatives to reach out to the children.

Physical activity in the broadest sense was re-thought and adjusted to the circumstances, and digital offers were created: "Beweg dich Schlau!" an initiative for children and adolescents founded by Felix Neureuther a German ski racer, has the aim to motivate children in kindergarten, school and leisure time to move more and specially to move clever (BDS 2021). "Bewegungspause trotz Abstand" created by Herrmann and Hirth (2020) gathered ideas for movement breaks, which can be used not only during Covid-19 pandemic or at school, but in different settings. These developments give children and adolescents incentives to carry out movement breaks despite hygienic measures (Herrmann & Hirth 2020). Further examples are

“Albas tägliche Sportsunde”, “Henriettas bewegte Schule” and many more. Teachers, educators, parents and also children got different exercise sequences for various situations. With the help of digital offers and online options, physical activity and education was not totally put on hold, but it changed in a one-dimensional way, to an activity where the culture of feedback played a less important role.

When one considers the federal states of Germany, at that level there are peculiarities, which also came to surface during the lockdowns. Children live for example in one federal state but visit a school at the neighbour federal state, because they live close to the border. As a result, state level definitions of sport meant that two friends attending the same school got different regulations regarding physical activity in their home sport club. For example, one student is allowed to practice at the elite sport base while the other one is not allowed due to the different regional regulations. This results not least from the different organizational structure for sport in the different federal states.

Another example, which underlines how different regulations impact a sporting activity, is horse riding. The German governing body for riding - Fédération Equetsre Nationale - has not been able to issue uniform Covid-19 regulations nationwide (Deutsche Reiterliche Vereinigung 2020). This was because the government, the federal states, the counties and the various municipalities were each in charge of regulation the sport in their districts (Deutsche Reiterliche Vereinigung 2020). It is not surprising that these different levels of responsibility and bureaucracy result in differing restrictions at local and regional levels (Deutsche Reiterliche Vereinigung 2020). In one municipality horse riders were allowed to go on trail rides while in the next county horse riders were only allowed to ride in the outdoor arena. It is clear from this example that even federal organizations for sport could not always clarify the specific rules of the sport to apply for their members. The different regulations applied to sport clubs from municipality to municipality were not the only difficulties faced by clubs and organizations. Due to the pandemic regulations and to the lockdown, most sport clubs needed to limit their offerings and as a result 7.3 million children and adolescents were not able to participate in any offerings from sports clubs (tagesschau 2021).

Regulations for sport clubs differed between the individual federal states. The regulations for NRW for example prohibited team sports, contact sports or any sport involving more than two person (Soziokultur NRW 2020). In addition, all public sport facilities were closed (Soziokultur NRW 2020). The only exceptions were practice facilities at federal elite sport bases, where sportspeople were allowed to practice (Soziokultur NRW 2020).

In Baden-Wuerttemberg on the other hand there were no exceptions for federal elite bases (Baden-Württemberg 2020). Sports clubs in all federal states have reported a decline in memberships of between 3 – 5 %. Larger clubs have especially reported a significant loss of memberships (Rieger 2021). The Landessportbund NRW for example has had a decline of 16 % in memberships and enrollments, especially in the age group of 0 - 6 years old (Landessportbund NRW 2021a).

Discussion

As already noted, some of these results require further discussion and cannot be taken as logical outcomes from the pandemic. One topic which especially needs to be discussed is whether habitual physical activity can replace organized sport, as a type of sporting activity offered by sports clubs, even taking into account the different levels of intensity. Naul (2021) expresses criticism of this theory, as his study has shown that physical habitual activity does not lead to a significantly higher level of physical activity by children and adolescents (Naul 2021). Taking all evidence into account, Naul (2021) points out that the study results need to be interpreted carefully with regard of the composition of the data.

Additionally, it is questionable if digital offers and virtual solutions really can replace physical education taught by a qualified and educated teacher. The ministry of health in Germany has issued guidance that physical education lessons need to be taught even though the circumstances are not optimal (Bundesministerium für Gesundheit 2021). Physical education needs practical solutions in times of Covid-19 pandemic, but as far as possible, it is necessary to actively teach physical education even in digital formats (Bundesministerium für Gesundheit 2021). The BMG has further identified that physical education is essential to a school's curriculum, because of the positive effects of physical activity on psychosocial and mental health and its contribution to social-emotional developments of students (Bundesministerium für Gesundheit 2021). In addition to that, it should be noted at this point that the WHO have identified inactivity as a risk factor for Covid-19 (Bundesministerium für Gesundheit 2021). The necessity of physical activity in school and kindergarten is therefore a given. It is not yet possible to foresee the consequences of the lack of physical education in schools and physical activity programs in kindergarten on children's motor skills and motoric development (Naul 2021). Further research is needed, and especially in connection with the drastically increased screen times of children and adolescents during the lockdowns, which was noted earlier. The results of the COPSY-study are also of concern. Many children describe a lower life quality due to the pandemic and the lockdown (Ravens-Sieberer et al. 2021). In the context of these

results, physical activity takes on an even greater importance, as studies in the past have already proven that regular physical activity has a positive effect on well-being, and mental and physical health. One way to increase physical activity is to participate in sports clubs, but due to the restrictions, many sport clubs did not and could not offer any services. There is no doubt that sports clubs have also faced multi-faceted problems during the lockdowns. However, the so-called death of clubs should be viewed with caution. Trends were already emerging before the pandemic. In population surveys of the state of North Rhine-Westphalia carried out over the last decade, it can be seen that the number of clubs has been in decline since 2010 (Landessportbund NRW 2016). Rather than being the cause of sudden death for clubs, it is more likely that the pandemic acted as a "facilitator" and accelerated a trend which already existed. The developments in connection with sport clubs and pandemic also need to be critically interpreted against the background of demographic changes.

For many years, the tendency has been for schools and educational facilities to cut physical education (and physical activity) from the syllabus when there is a financial or budgeting problem. During the pandemic this was exacerbated when the gyms were used as vaccination centers and outdoor possibilities for activities were limited. This in spite of the fact that physical activity is widely recognized as an essential part of a healthy lifestyle and even supported by health-insurance-companies.

Conclusion

The present overview suggests that the lockdowns in Germany had a significant impact on the physical activity of children and adolescents. The possibilities for organized sport in kindergarten, schools and sport clubs has been reduced or removed. In addition, a change in the way, how children and adolescents spend their leisure time, has taken place, with the time spent with screen media almost doubled by the end of lockdown two. Overall, less time was spent on physical activity even though in lockdown one more children and adolescents met the WHO guidelines of physical activity. However, the composition of the data should be viewed with caution as it was self-reported by children or their parents, and a comparison before and after the pandemic is therefore difficult. What is certain is that the general quality of life and specifically the health-related quality of life of children and adolescents greatly diminished during lockdown.

An easily applied and useful means to improve the lives and mental health of as many children as possible would be to increase physical education in kindergartens and school. In reality however, physical education especially in schools was reduced or removed, because of

the assumed importance and necessity to catch up in other subjects. However, sport is essential for the holistic development of children and adolescents and it would appear to be essential to reestablish offers for physical activity as soon as possible in order to strengthen the quality of life and health related factors for children and adolescents in Germany.

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