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Changes in Lifestyle and Body Weight in Children and Adolescents during the COVID-19 Pandemic: A Representative Survey of Parents in Germany

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Keywords
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Abstract
Introduction: The public restrictions taken during the COVID-19 pandemic have substantially affected lifestyle and health behavior of children and adolescents. In Germany, little is known how these changes influenced daily life in families with children and adolescents. ***Methods:*** A cross-sectional survey was performed in April/May 2022 across Germany, similar to a survey performed in 2020. Parents ($N = 1{,}004$, 20–65 years) with at least one child aged 3–17 years filled in an online questionnaire released by the Forsa Institute for Social Research and Statistical Analysis. Fifteen questions related to eating habits, dietary patterns, physical activity, media consumption, fitness, mental health, and body weight were included, and standard socioeconomic parameters were assessed. ***Results:*** Parents' answers indicated that there was a parental self-reported weight gain in every sixth child since the beginning of the COVID-19 pandemic. This was most obvious in children from families with lower household income and preexisting overweight. Parents also reported that lifestyle patterns had worsened: 70% reported an increase of media consumption during leisure time, 44% a decrease in daily physical activity, and 16% the worsening of dietary habits (e.g., 27% stated to eat more cake and sweets). Children aged 10–12 years were most severely affected. ***Conclusion:*** Negative health effects related to the COVID-19 pandemic are predominantly observed in children 10–12 years of age and in children from families with low household income, suggesting a worsening social disparity. Political action is urgently needed to tackle the adverse consequences of the COVID-19 pandemic on childhood lifestyle and health.

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Introduction

The COVID-19 pandemic containment measures resulted in lockdowns including closures of kindergartens, schools, and sports facilities. Homeschooling and social distancing have led to social isolation, loneliness, and reduced interaction with peers. Several studies have shown that these restrictions significantly affected children's lifestyles and health behaviors [1–6]. Most studies showed a significant increase in media time and a decrease in physical activity combined with increased snacking. All these changes in lifestyle habits have resulted in an increase in obesity prevalence [1–3, 6]. A recent study has examined the change in weight development during the first months of the COVID-19 pandemic. Trends in the 3-month change in standard deviation score of body mass index (BMI-SDS) have been compared between 2005 and 2019 and the respective changes have been investigated from 2019 (before the COVID-19 pandemic) to 2020 (after the start of containment measures) based on the German CrescNet database. An increase of BMI-SDS in all age and weight groups during the COVID-19 pandemic period was shown, which was particularly evident in children with preexisting obesity [7]. In addition, analysis of data from the Adiposity Patient Follow-up Registry (APV) has shown that BMI-SDS has significantly increased in 2020 compared to 2019 and 2018 in children and adolescents with overweight and obesity from Germany, Austria, and Switzerland [8]. Both databases are not representative and provide regional (CrescNet) and/or trends for certain groups of children, i.e., with preexisting obesity (APV). Similar trends were also reported from the USA [9] and Italy [10].

Before the COVID-19 pandemic, 15.4% of children and youth aged 3–17 years were overweight and obese in Germany [11]. Moreover, there are known deficits in dietary habits and daily physical activity in children and adolescents: children aged 6–11 years consume twice as much of "tolerated" foods such as sweets and salty snacks, but only half of the recommended amounts of fruits and vegetables [12]. Regarding daily physical activity, only 10% of adolescent girls and 17% of adolescent boys reach the recommendations of the World Health Organization for 60 min of daily exercise [13]. However, there are limited data on the association between the COVID-19 restrictions, lifestyle behavior, and body weight.

A first representative online survey on the effect of the COVID-19 pandemic on dietary patterns, related health issues, and body weight change in families in Germany was conducted in September 2020. Results showed a self-reported weight gain in 27% of interviewed parents and in 9% of children and adolescents, with a 2.5 times higher risk of weight gain in children whose parents had a low level of school education (<10 years) [6]. The increase in body weight affected mostly school-aged children, particularly the age group of 10- to 12-year-olds (19%) [6]. In addition, parents reported reduced physical activity in a large proportion of children (38%), and children 10 years and older were again most frequently affected (60%). A less favorable diet (higher consumption of salty snacks [18%], sweet snacks [20%], and soft drinks [18%]) was also reported for a significant proportion of the families [6]. The current study represents a second cross-sectional survey from March/April 2022, similar to the survey performed in 2020, to assess how the ongoing COVID-19 pandemic is affecting the lifestyle and body weight in children and adolescents.

Materials and Methods

For this representative cross-sectional online survey, the Forsa Institute for Social Research and Statistical Analysis (forsa Politik- und Sozialforschung GmbH, Berlin, Germany) interviewed parents with at least one child aged 3–17 years between March 28, 2022 and April 11, 2022. For this purpose, 1,004 participants were chosen by a random selection process of a representative sample of around 10,000 households in Germany from the forsa.omninet database (https://www.forsa.de/1/methods/). Online interviews were performed with parents aged 20–65 years. If the family had more than one child in the respective age group, parents were asked to answer the questions for the child with the last birthday. Parents were asked to answer the questions in relation to the COVID-19 pandemic-induced changes. In total, 1,780 invitations to participate were sent out. Of the 1,092 parents who completed the screening questions, 36 had to be excluded (as the child did not live in household anymore). Fifty-two parents did not complete the interview. Thus, complete interviews were available from 1,004 parents.

The survey included 15 questions comprising family- and household-related questions (including whether and how often one or both parents had worked in home office since the beginning of the COVID-19 pandemic (5)), questions related to weight status (2), physical activity and fitness (2), dietary and eating habits (4), media consumption (1), and mental health (1). Eight of these questions, which focused on children's health, were identical with the survey from 2020. Results of this former survey, which also included data on parents' health, have been previously described in more detail [9]. In addition, standard questions on sociodemographic characteristics were included. The original questions of the present survey are available in the respective figures and tables.

Descriptive statistics were performed, and data are presented as absolute numbers (*n*) and percentages (%). Graphs and tables were created using Microsoft Excel, version 2016.

Table 1. Descriptive characteristics of participating families/parents: a total of 1,004 parents completed the survey

		Sex		Age, years			Living in partnership		Educational graduation		Home office			Monthly net income of household (€)			Size of community (*N* residents)				
	total	male	female	20–34	35–44	45–65	yes	no	2. school level certificate	university degree	yes	partially	no	<3,000	3,000–4,500	≥4,500	<5,000	5,000–20,000	20,000–100,000	≥100,000
Total, *N* (%)	1,004 (100)	505 (50.3)	499 (49.7)	192 (19.1)	450 (44.8)	362 (36.1)	883 (87.9)	121 (12.1)	493 (50.2)	489 (49.8)	327 (32.6)	348 (34.7)	329 (32.7)	192 (20.5)	390 (41.7)	353 (37.8)	161 (16.0)	269 (26.8)	297 (29.6)	277 (27.6)
1 child, %	54	53	54	68	41	63	52	69	57	51	52	50	59	69	53	47	50	54	54	56
2 children, %	37	38	37	28	46	32	39	28	35	40	39	40	34	26	38	42	43	37	38	35
3 and more children, %	9	9	8	5	13	6	9	3	8	9	9	10	7	5	8	11	7	9	9	9

Data are presented for the entire cohort as well as depending on the number of children in the family. (Missing values: 22 parents did not indicate information on educational graduation and 69 parents did not indicate monthly net income of household.)

Results

Characteristics of Survey Participants

The survey was completed by a total of 1,004 adults (499 women, 505 men). Detailed characteristics including the number of children of participating families are presented in Table 1. Parents provided data on a total of 479 girls and 525 boys aged 3–5 years (24.4%), 6–9 years (23.3%), 10–12 years (17.8%), 13–14 years (13.1%), and 15–17 years (21.4%) (Table 1).

About one-third (33%; $n = 327$) of the participating parents answered to work in home office for the last 2 years, one-third (34%; $n = 348$) worked in home office partially, and one-third (33%; $n = 329$) did not work in home office at all (Table 1). Distributions were similar regarding age and sex of the parents. However, working in home office was more often reported by parents who had completed a university degree compared to parents with a secondary school leaving certificate. Parents with higher net household income (≥4,500 €) worked more often in home office compared to parents with lower net household income (<3,000€) (Table 1).

Parental Self-Reported Changes in Body Weight of the Children and Adolescents

The answers of the parents indicated that in every sixth child (16%) there was slight or substantial excess body weight gain since the beginning of the COVID-19 pandemic. No differences could be observed depending on age and home office occupation of parents or size of the local community. However, the prevalence was twice as high in children from low-income families (23%) compared to children from high-income families (12%) (Table 2; Fig. 1).

According to the parents' answers, children aged 10–12 years were most frequently affected by an excess (slight or substantial excess together) increase in body weight during the COVID19 pandemic (32%). The lowest prevalence of excessively (slight and substantial excess together) increasing body weight was observed in preschool children aged 3–5 years (7%) (Table 3).

Furthermore, answers of the parents indicated that almost every second child (47%) who was already overweight before the beginning of the COVID-19 pandemic further gained weight in an unhealthy manner (slight and substantial excess together) during the COVID-19 pandemic. This was a higher weight gain compared to children with normal weight (13%) or underweight (6%) before the COVID-19 pandemic (Table 3; Fig. 2).

Table 2. Parental self-reported changes in body weight of children and adolescents depending on parental and socioeconomic factors (missing values: 22 parents did not indicate information on educational graduation and 69 parents did not indicate monthly net income of household)

		Age of parent, years			Educational graduation		Home-office			Monthly net income of household (€)			Size of community (*N* residents)			
	total	20–34	35–44	45–65	secondary school level cerfiticate	university degree	yes	partially	no	<3,000	3,000–4,500	≥4,500	<5,000	5,000–20,000	20,000–100,000	≥100,000
Total, *N* (%)	1,004 (100)	192 (19.1)	450 (44.8)	362 (36.1)	493 (50.2)	489 (49.8)	327 (32.6)	348 (34.7)	329 (32.7)	192 (20.5)	390 (41.7)	353 (37.8)	161 (16.0)	269 (26.8)	297 (29.6)	277 (27.6)
Substantial weight loss, %	1	1	1	2	1	1	1	1	1	–	1	1	<0.5	1	1	1
Slight weight loss, %	6	9	6	6	7	6	9	6	5	9	5	5	8	7	5	6
No change observed, %	76	73	80	73	72	80	76	79	74	68	77	81	79	74	74	79
Slight excess weight gain, %	14	14	12	16	16	12	12	12	18	19	14	11	11	16	16	12
Substantial excess weight gain, %	2	3	1	3	3	1	2	2	3	4	3	1	1	2	3	2

Question: Would you say that your child lost or gained weight since the beginning of the COVID-19 pandemic? (answer options: substantial weight loss, slight weight loss, no change observed, slight excess weight gain, substantial excess weight gain).

Mental Health

In total, 43% of the parents reported that the COVID-19 pandemic had a moderate or strong impact on mental health of their children and adolescents. However, children from low-income families were twice as much "strongly" affected as children from high-income families (18% vs. 8%).

Regarding the age groups, mental health of 10- to 12-year-old children was most frequently moderately or strongly affected (49%) compared to other age groups, although other age groups showed almost similar percentages (e.g., 6–9 years: 45% or 13–14 years: 46%). There were no differences between boys (42%) and girls (45%). Among the children in whom the COVID-19 pandemic had a strong impact on mental health, a higher rate of excess (slight and substantial excess together) increase in body weight (25%) was reported compared to children with moderate (9%) or no (10%) impact on mental health.

Dietary Behavior

Around three quarters of the parents (76%) answered that the dietary behavior of their child did not change through the 2 years of the COVID-19 pandemic, while 16% answered that dietary behavior worsened overall. For those children and adolescents with existing overweight before the COVID-19 pandemic, 31% of the parents reported a deterioration in dietary behavior compared to 14% of children and adolescents being normal weight or 12% being underweight before the COVID-19 pandemic (Table 4).

Dietary Patterns

In total, 27% of the parents indicated that their children and adolescents ate more cake and sweets. Around 20% answered that children and adolescents ate more snacks and more fruits. In addition, the consumption of fast food (16%), potatoes, pasta, rice (13%), and soft drinks (13%) increased (Table 4). These changes increased with lower mental health and with higher body weight of children and adolescents (Table 4). Furthermore, 34% of the parents answered that the number of meals eaten together increased during in comparison to before the COVID-19 pandemic. One-third (30%) cooked more at home (data not shown).

In preschool children, the intake of fruits increased, whereas in older children an increase of snacks and cake and sweets was observed. The latter was most evident in children aged 10–12 years (Fig. 3).

Physical Activity and Fitness

A reduction of children's physical activity was reported by 44% of the parents, whereas 7% of children

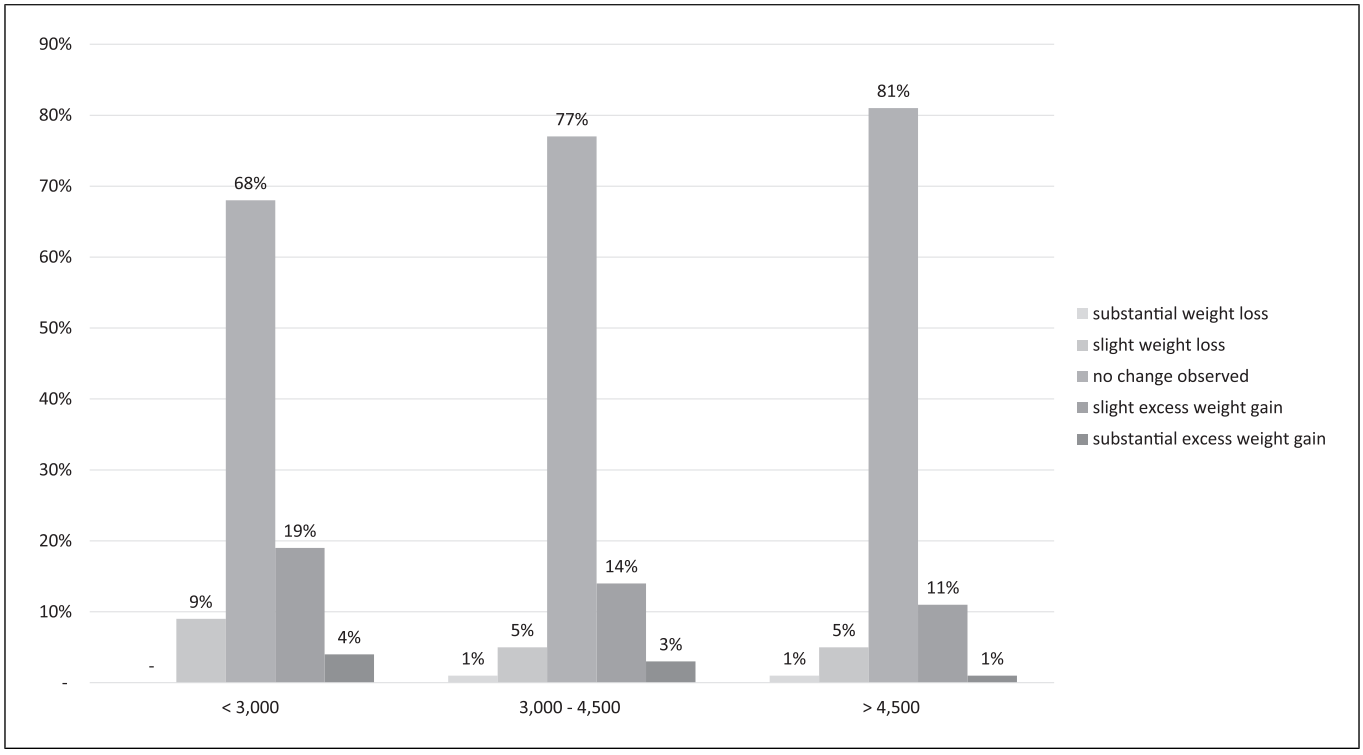

Fig. 1. Parental self-reported changes in body weight of children (3–17 years) since the beginning of the COVID-19 pandemic in relation to net household income (€) (n = 935; numbers are given as percentage). Question: Would you say that your child lost or gained weight since the beginning of the COVID-19 pandemic? (answer options: substantial weight loss, slight weight loss, no change observed, slight excess weight gain, substantial excess weight gain).

increased their physical activity. Again, according to the parents' answers, children aged 10–12 years most frequently had reduced physical activity (57%) compared to other age groups. About one-fourth of preschool children were affected by decreased physical activity (26%). However, this decrease was lower in this age group compared to the other age groups (Fig. 4). In parallel, physical fitness has declined in 33% of all children, with children from low-income families being almost twice as often affected as children from high-income families (43% vs. 25%) (Fig. 4).

Media Consumption

A total of 70% of children had increased their leisure time media consumption (i.e., watching TV, use of smartphone, PC, game console) since the beginning of the COVID-19 pandemic according to their parents' notice, whereas 1% of children had decreased it. These findings were observed in all socioeconomic groups and were independent of parental age, marital status, educational degree, and home office occupation as well as size of community where the families lived, irrespective of the sex of the children (data not shown). A similar increase in media consumption of about 70% was described by parents for children and adolescents of all ages between 6 and 17 years. Preschool children had also increased their media consumption; however, the increase in this age group was reported to be 56% (Fig. 4).

Discussion

In this representative online survey among parents in Germany, we were interested to determine the impact of repeated lockdowns and episodes of closure of educational institutions, home-schooling and social distancing on lifestyle, body weight, and mental health of children and adolescents during 2 years of the COVID-19 pandemic. With regard to a self-reported increase in body weight during the COVID-19 pandemic above what would have been expected based on physical development

Table 3. Parental self-reported changes in body weight of children and adolescents according to sex, age, mental health, and body weight before the COVID-19 pandemic

		Sex of child		Age of child, years					Change in mental health			Body weight category before the COVID-19 pandemic		
	total	male	female	3–5	6–9	10–12	13–14	15–17	not at all	slightly	moderate/ strong	underweight	normal weight	overweight or obese
Total, *N*	1,004	479	525	245	234	179	132	215	165	388	437	75	812	115
Substantial weight loss, %	1	1	1	–	–	1	1	2	2	<0.5	1	–	<0.5	6
Slight weight loss, %	6	7	6	5	3	6	11	8	6	5	8	3	6	13
No change observed, %	76	76	76	88	84	61	70	71	82	85	66	91	81	34
Slight excess weight gain, %	14	14	14	6	10	28	15	15	9	8	21	6	12	35
Substantial excess weight gain, %	2	2	3	1	2	4	2	3	1	1	4	–	1	12

Question: Would you say that your child lost or gained weight since the beginning of the COVID-19 pandemic? (answer options: substantial weight loss, slight weight loss, no change observed, slight excess weight gain, substantial excess weight gain). If you think back before the COVID-19 pandemic: Your child was . . .? (answer options: underweight, normal weight, overweight, obese). How much does the corona pandemic burden your child's mental health? (answer options: not at all, slightly, moderate, strong).

[14], our results are in line with other studies from Germany [7, 8, 15], the USA [9, 16–18], Italy [10], the Netherlands [19], Austria [20], China [21], and Korea [22], which have also shown that body weight has increased disproportionately in children and adolescents since the beginning of the COVID-19 pandemic. In addition, the risk for weight gain during the COVID-19 pandemic was higher for children from low-income families [16] and for children with preexisting overweight or obesity [7, 17], a finding that was also observed in our survey.

According to our results, mental health of nearly half of all children and adolescents was affected moderately or strongly during the COVID-19 pandemic – especially in those families with a low household income as well as in younger adolescents (i.e., 10–12 years old), although the other age groups were also substantially affected. The high mental health burden since the COVID-19 pandemic is also prevalent in many other countries, e.g., UK [23], China, and USA [24–26]). We cannot compare the data with our first survey from 2020 in which data on mental health were not collected. However, other studies have shown an increase of mental disease during the COVID-19 pandemic [6, 23, 27, 28]. A German representative study has shown that children and adolescents reported a lower health-related quality of life, more mental health problems, and a worsened health behavior [28].

We did not look for other factors that could contribute to mental stress. Further investigations would be necessary to provide more profound knowledge about the causes of COVID-19-attributable mental health issues in children and adolescents. With regard to eating habits and dietary patterns, data of this survey show that unhealthy dietary patterns such as snacking, consumption of high-energy-dense foods, and sugar-sweetened beverages increased during the COVID-19 pandemic, while the consumption of foods and beverages with a low energy, but high nutrient density decreased. Compared to data from an earlier survey, dietary habits did not improve compared to the first COVID-19-related lockdown period [6].

In the Diet and Activity of Youth during COVID-19 (DAY-19) study, 1,334 primary school students aged 10–16 years were asked about their food habits during the COVID-19 pandemic [29]. This study resulted in significant changes in eating habits, whereas most changes were positive (e.g., eating servings of fruit), especially in the subgroup of adolescents with decreased body mass and increased physical activity level [29]. In our survey, some positive changes were also observed: an increased frequency of eating together at home or of cooking at

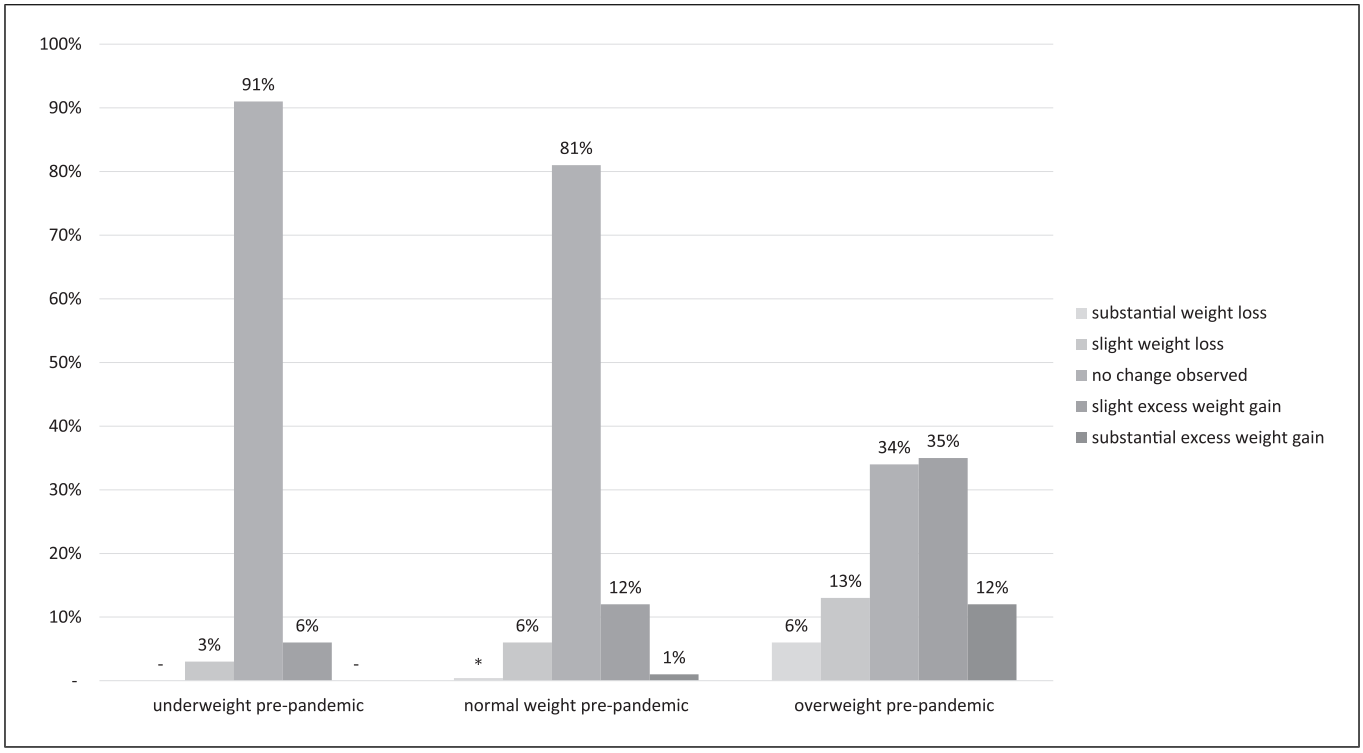

Fig. 2. Parental self-reported changes in body weight of children and adolescents (aged 3–17 years) since the beginning of the COVID-19 pandemic in relation to the pre-pandemic weight status (n = 1,004; numbers are given as percentage). Question: Would you say that your child lost or gained weight since the beginning of the COVID-19 pandemic? (answer options: substantial weight loss, slight weight loss, no change observed, slight excess weight gain, substantial excess weight gain). If you think back before the COVID-19 pandemic: Your child was . . .? (answer options: underweight, normal weight, overweight, obese).

home, which might be due to the fact that families spent more time at home during the COVID-19 pandemic.

Early reports demonstrated a downward trend in physical activity levels [30], whereas sedentary activity, mainly screen time, increased [31]. In a systematic review, 16 studies with 11,484 participants (5,587 female) aged between 4 and 18 years were analyzed [32]. Eight of the studies found a reduction in physical activity parameters. Three studies showed both an increase and a decrease in physical activity during the COVID-19 pandemic. For Germany, Schmidt et al. [31] and Nigg et al. [33] described a reduction in sport-related physical activity on the one hand and an increase in active days and habitual physical activity (playing outdoors, walking and cycling, gardening, housework) on the other hand. However, when considering the changes in physical activity overall, it is obvious that the legal requirements released across many countries resulted in many restrictions during the respective COVID-19 pandemic situation. For example, in the first year of the COVID-19 pandemic, gyms and sports clubs in Germany were largely closed.

Focusing on the use of digital media in nearly 2,000 adolescents between 12 and 18 years old, Salzano et al. [34] reported that participants spent more than 6 h a day on screens for educational purposes and from 4 to 6 h a day for recreational activities (during quarantine). The authors pointed out the two sides of the coin: on the one hand the usage of digital technology to stay in contact with peers, and on the other hand it also meant a health risk due to weight gain, social isolation, and media addiction [35, 36]. The results of our survey also indicate an unfavorable increase in leisure time media consumption. This increase was independent of household income and education level of the parents.

However, it should be emphasized that most adverse changes in lifestyle were associated with the socioeconomic status of the families suggesting a social disparity of the effects induced by the COVID-19 pandemic. It is obvious that socially disadvantaged families were less able

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Table 4. Parental self-reported changes in dietary behavior and consumption of food groups of children and adolescents according to sex, age, mental health, and body weight before the COVID-19 pandemic

		Sex of child		Age of child, years					Change in mental health			Body weight category before the COVID-19 pandemic		
	total	male	female	3–5	6–9	10–12	13–14	15–17	not at all	slightly	moderate/ strong	underweight	normal weight	overweight or obese
Total, *N*	1,004	479	525	245	234	179	132	215	165	388	437	75	812	115
Dietary behavior, %														
Eating more healthy	8	8	8	7	5	5	7	15	11	7	8	10	8	7
Eating less healthy	16	15	17	13	13	19	19	19	6	11	25	12	14	31
No change in eating	76	76	76	81	81	76	73	66	84	82	67	79	78	62
Food groups, %														
Cake and sweets	27	28	26	29	26	30	25	24	19	23	34	29	25	42
Snacks	21	21	22	13	15	31	25	27	13	16	30	20	19	37
Fruits	19	20	17	26	20	14	12	18	21	18	19	20	19	20
Fast-food	16	16	16	13	18	15	16	16	10	13	20	16	15	20
Potatoes, pasta, rice	13	12	15	16	13	13	14	11	12	9	18	14	13	18
Soft drinks	13	12	14	7	10	15	14	21	7	11	17	17	11	25
Vegetables	12	13	12	11	15	11	11	13	15	11	12	21	12	13
Meat and cold cuts	8	8	7	9	9	6	7	7	5	5	11	14	6	16

Question: If you think back before the COVID-19 pandemic: Your child was . . .? (answer options: underweight, normal weight, overweight, obese). How much does the COVID-19 pandemic burden your child's mental health? (answer options: not at all, slightly, moderate, strong). Now about "nutrition." In your opinion: Since the beginning of the COVID-19 pandemic, has your child been eating healthier than before, rather less healthy, or is there no significant change? (answer options: eats healthier than before the COVID-19 pandemic, eats less healthy, no change). Now you see some food and meals. Please indicate whether your child has eaten more, less, or similar amounts of it since the beginning of the COVID-19 pandemic. (answer options: more, less, similar amounts; snacks (chips, flips, pretzel sticks), cakes and sweets (chocolate, gummy bears, biscuits, ice cream), fruits, vegetables (without potato), potatoes/pasta/rice, meat and cold cuts, soft drinks (cola, lemonade, ice tea, sports drinks, energy drinks, fast-food (burger, French fries, pizza, kebab)).

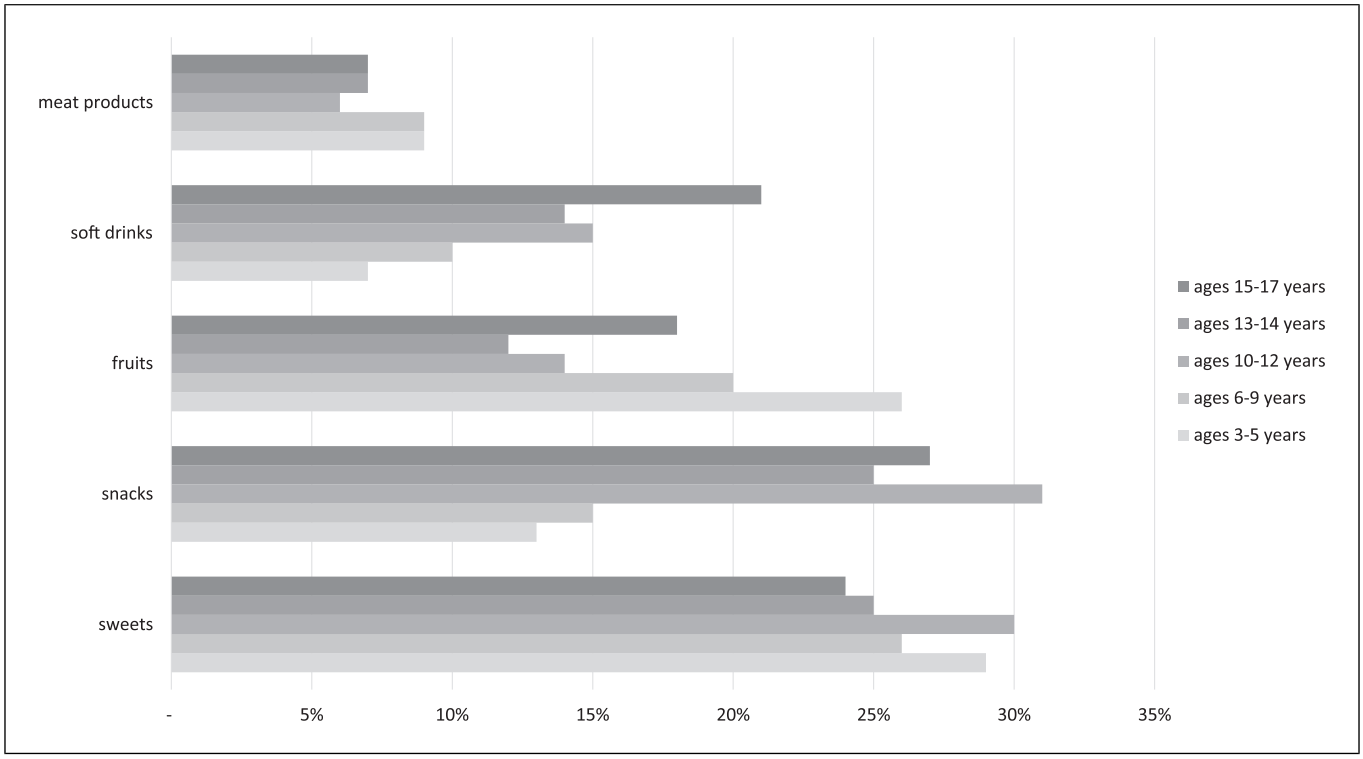

Fig. 3. Parental self-reported changes in consumption of selected food groups since the beginning of the COVID-19 pandemic by age groups (shown as percentage; $n = 1{,}004$); percentage of parents indicating more consumption of specific food is shown. Question: Now you see some food and meals. Please indicate whether your child has eaten more, less, or similar amounts of it since the beginning of the COVID-19 pandemic (answer options: more, less, similar amounts of snacks (chips, flips, pretzel sticks), cakes and sweets (chocolate, gummy bears, biscuits, ice cream), fruits, vegetables (without potato), potatoes/pasta/rice, meat and cold cuts, soft drinks (cola, lemonade, ice tea, sports drinks, energy drinks), and fast-food (burger, French fries, pizza, kebab)).

to cope with the multiple challenges of the COVID-19 pandemic than families with higher household income and better education. This finding may have main implications, as it may argue for special support programs for these disadvantaged families.

The restrictions introduced during the lockdowns also affected the medical care of children and adolescents, which may have contributed to the aggravation of the obesity epidemic in this age group. Personal treatment appointments were almost impossible for months. Therefore, the consequences in terms of excess weight gain were particularly pronounced for children with preexisting overweight or obesity.

The most striking difference between the present results and the results of the survey performed in 2020 after the first lockdown was that the percentage of parents reporting excess weight gain of their children almost doubled [6]. It is also noteworthy that the changes in eating behavior and physical activity were more or less stable during the 2 years of the COVID-19 pandemic, suggesting that its negative consequences are not short-term and hard to reverse without specific efforts and probably political measures.

Strengths and Limitations

The representative nature and the large sample size are strengths of this survey. Furthermore, this survey repeated parts of a former survey [6], which allows a description of the situation at two different time points of the COVID-19 pandemic. The data are limited by the fact that not the same persons have been interviewed during the two time points. This is the reason why only a descriptive, but no comparative statistical analysis could be performed. Furthermore, by nature there is no control group available. Additionally, the possible influence of the very dynamic course of the COVID-19 pandemic cannot be assessed. It has to be mentioned that participation in the survey was voluntary; therefore, a selection bias cannot be ruled out. Answers were self-reported and did not include data that were objectively measured or derived from validated questionnaires. Moreover, the data were self-reported and

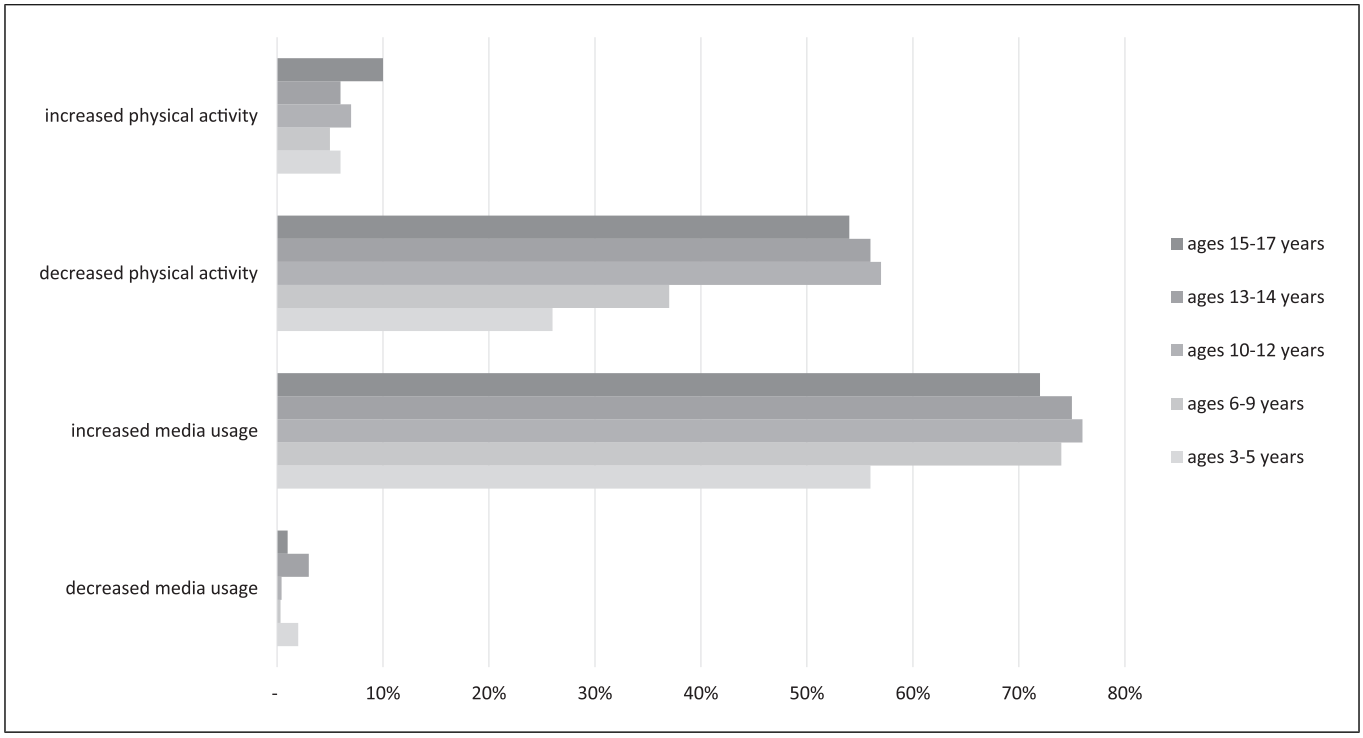

Fig. 4. Parental self-reported changes in physical activity and media consumption since the beginning of the COVID-19 pandemic within the different age groups (n = 1,004). Question: When you think about physical activity: Since the beginning of the COVID-19 pandemic, have your child's physical activities . . .? (answer options: increased, decreased, not changed). Please now think about your child's leisure media consumption (e.g., TV, smartphone, PC, video game console): Would you say that since the beginning of the COVID-19 pandemic this has increased/decreased or have there been no significant changes? (answer options: increased, decreased, no change).

may be subject to misperception from the parents. In addition, no information on migrant background was collected.

Conclusions

According to our survey, every sixth child has increased body weight in an unhealthy manner since the beginning of the COVID-19 pandemic, and this was most obvious in children from families with lower household income and with preexisting overweight or obesity. Lifestyle patterns have worsened and included an increase of media consumption during leisure time, a decrease in daily physical activity and fitness level, and a worsening of dietary habits and eating patterns. Two years after the onset of the COVID-19 pandemic, there is evidence that its unfavorable effects are not spontaneously reversible. Political action is required to avoid long-term adverse consequences for child and adolescent health.

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Statement of Ethics

Due to the conduction of the survey by a professional provider, this survey was not approved by the Local Ethical Review Committee. Therefore, ethical approval was not required due to local/national guidelines. A random sample from the general FORSA panel (forsa.omninet), which has given digital informed consent, was invited for this survey. The participation was voluntary and data collection was conducted anonymously. Parents were interviewed about the health status and lifestyle behavior of their children; therefore, no underaged human participants have been included.

Conflict of Interest Statement

S.W.-B. has received speaker honoraria from Merck Serono GmbH, Novo Nordisk, and Astra Zeneca and is a consultant in a scientific advisory board with NovoNordisk. C.H. is a member of the Scientific Advisory Board of 4sigma GmbH. H.H. is a member

of a Novo Nordisk Advisory Board on obesity and a member of a Scientific Advisory Board for Oviva A.G., Potsdam. C.J. received speaker honoraria from Novo Nordisk, Amgen, Berlin Chemie, MSD Sharpe und Dohme, Novartis, Abbvie, Pfizer, Janssen, Lilly, and Daiichi Sankyo und Chiesi. C.J. is a member of a Novo Nordisk Advisory Board on obesity in children and adolescents. O.H., J.P., S.W., and G.T. have no conflicts of interest.

Author Contributions

The contributions of all authors are as follows: conceptualization: all authors; methodology: all authors; writing – original draft preparation: S.W.-B. writing – review and editing: C.J., J.P., G.T., S.W., C.H., and H.H.; and graphs: O.H. All authors have contributed substantially to the work.

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Data Availability Statement

The data presented in this study are not publicly available. All data generated or analyzed during this study are included in this article. Further inquiries can be directed to the corresponding author. Also the original data are available on request from the corresponding author.

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