

#### The "11 for Health in Denmark" intervention in 10- to 12-year-old Danish girls and boys and its effects on well-being—A large-scale cluster RCT

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The "11 for Health in Denmark" intervention in 10–12year-old Danish girls and boys and its effects on well-being
– a large-scale cluster RCT

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#### 51 Abstract

52 **Background:** The present study investigates the wellbeing effects for 10–12-year-old 53 children of the school-based intervention "11 for Health in Denmark", which comprises 54 physical activity (PA) and health education. Subgroup analyses were carried out for boys and 55 girls.

Method: 3061 children were randomly assigned to an intervention group (IG) or a control 56 group (CG) by 5:1 cluster randomisation by school. 2533 children (mean age 11.5±0.4; 49.7% 57 boys) were assigned to IG and 528 children (mean age 11.4±0.5; 50.8% boys) were assigned 58 59 to CG. IG participated in the "11 for Health in Denmark" 11-week programme, consisting of 2x45 min per week of football drills, small-sided games and health education. CG did not 60 participate in any intervention and continued with their regular education. Before and after the 61 intervention period, both groups answered a shortened version of the multidimensional well-62 63 being questionnaire KIDSCREEN-27.

**Results:** The "11 for Health in Denmark" intervention programme had a positive effect on physical well-being in girls (IG:  $48.6\pm8.5$  to  $50.2\pm9.3$ ), whereas the improvement was not significant in boys. The programme also had positive impact on well-being score for peers and social support (IG:  $50.2\pm10.2$  to  $50.8\pm10.1$ ), but when analysed separately in the subgroups of boys and girls the changes were not significant. No between-group differences were found for psychological well-being or school environment.

70

Conclusion: The intervention programme had a positive between-group effect on physical well-being in girls, whereas the change was not significant in boys. The overall scores for peers and social support improved during the intervention period, but no subgroup differences were found.

Keywords: School setting, physical activity, KIDSCREEN-27, physical well-being,
psychological well-being

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#### 80 Introduction

The World Health Organization (WHO) has identified mental health as one of the most important health concerns of the 21<sup>st</sup> century <sup>1</sup>. Good mental health is essential to well-being, which can be defined as a person's mental, social and physical resources in relation to their mental, social and physical challenges <sup>2</sup>. If the challenges a person faces exceed their resources, this will negatively impact well-being, and vice versa <sup>2</sup>. Well-being starts developing in childhood, and it should therefore be a priority to provide children with the best possible foundation in order to continue the development throughout life <sup>3</sup>.

Several studies suggest a positive relationship between physical activity (PA) 88 and children's well-being, demonstrated by higher feelings of self-worth, vitality and reduced 89 depressive symptoms <sup>4,5</sup>. A meta-analysis by Liu et al. (2015) covering 25 studies (with 90 relatively small sample sizes) found interventions incorporating PA to be associated with 91 increased self-concept and self-worth in children and adolescents <sup>6</sup>. Furthermore, PA has the 92 potential for children to enhance their perceived competence and social well-being with 93 classmates and teachers <sup>7</sup>. However, in order for children to experience positive effects of PA, 94 they need to participate in it on a regular basis. A certain amount of daily vigorous PA seems 95 to be beneficial for well-being in young adolescents <sup>8</sup>. It is widely accepted that children need 96 to engage in moderate to vigorous PA (MVPA) for a minimum of 60 min every day, as 97 recommended by WHO. Unfortunately, the majority of 9-13-year-old children do not meet 98 99 the WHO recommendation and studies also show that the amount of MVPA decreases with age <sup>9</sup>. It is therefore important to take initiatives which aim at increasing the daily amount of 100 MVPA in children. 101

One possible way to achieve this is by increasing the amount of PA in schools. 102 Children spend many of their waking hours in school, and the setting is often considered ideal 103 for targeting a large number of children across all socioeconomic groups. It is also assumed 104 that PA interventions in school benefit from greater adherence compared to outside school 105 hours interventions<sup>10,11</sup>. The results with regards to the effectiveness of using school settings 106 to increase PA have varied in recent years. One comprehensive review of reviews investigated 107 studies aiming for increasing PA or fitness in youth found that school-based PA interventions 108 increased PA in schools <sup>12</sup>. However, a more recent meta-analysis investigated PA school 109 interventions aimed at increasing PA and using accelerometer data. The meta-analysis found 110 no effects of school-based PA interventions on the increase in overall PA <sup>13</sup>. Only a few 111

studies have investigated the effect of school-based PA interventions on multicomponent well-being. A review by Rafferty et al. (2016) covering 11 large-scale school studies produced mixed findings for changes in well-being, with three studies indicating a significant improvement and eight studies reporting no effect. Given the mixed findings, no firm conclusions can be drawn as to whether well-being can be improved through PA in schoolbased settings. More well-controlled studies are needed <sup>14</sup>.

However, research suggests that the type of PA might also play a role in 118 increasing children's well-being. For example, studies utilising team vs individual sports 119 showed advantages for team sports with regard to improving well-being <sup>15</sup>. Among other 120 benefits, the use of team games, in comparison to individual sports, may specifically offer 121 more opportunities to satisfy basic psychological needs, such as feelings of competence and 122 positive social relations <sup>16</sup>. A study by Vella et al. (2015) of leisure-time sport found that 123 children participating in team sports or a combination of team sports and individual sports 124 showed better well-being compared to children participating only in individual sports and 125 children not participating in sports at all <sup>17</sup>. McCarthy and colleges (2008) reported higher 126 levels of enjoyment for youth sport participants involved in team sports compared with 127 individual sports <sup>18</sup>. To the best of our knowledge, only one study has investigated the effects 128 of team vs individual sports in a school-based setting. The intervention study by Elbe et al. 129 (2017) compared children participating in 10 months of team or individual sport-based PA 130 131 and found a decrease in enjoyment and social cohesion for the group participating in individual sports, concluding that team sports were advantageous in the school-based setting 132 <sup>19</sup>. Altogether, the findings suggest psychological benefits of team sports for children, though 133 this conclusion is based on relatively few studies. 134

In the present study, we evaluated the effect of the programme "11 for Health in 135 Denmark" on multidimensional well-being. A previous pilot study of the programme showed 136 a positive outcome on social and school well-being measured using the paediatric quality of 137 life inventory questionnaire (PedsQL) <sup>20,21</sup>. The promising results from the pilot study 138 prompted this large-scale study. The larger sample size in the present study made it possible 139 to also investigate whether the programme had gender-specific effects, which was not 140 possible in the pilot. Gender is an important dimension, as studies have shown that girls 141 generally have lower well-being scores and are less physically active than boys 9,22-24. With an 142

expected lower starting point the girls should have more room for improvement in the well-being scores and might therefore benefit more from the intervention compared to the boys.

- 145 The aim of the present large-scale study was therefore to investigate the effect of 146 the "11 for Health in Denmark" programme on multicomponent well-being for all participants 147 combined, as well as separated by gender.
- 148 149 150 Methods
- 151

## 152 Participants

Schools from all over Denmark were issued with an invitation for their 5<sup>th</sup> grade classes to 153 participate in the "11 for Health in Denmark" programme. A total of 3061 children (mean age 154 11.5±0.5 years) from 111 different Danish schools spread throughout Denmark completed the 155 full questionnaires before and after the project and were thus included in this study. The study 156 was designed as a cluster-randomised controlled trial with schools as the individual clusters 157 <sup>25</sup>. The schools were randomly assigned to either a control group (CG) (20 schools, 528 158 children) or an intervention group (IG) (91 schools, 2533 children) in a 5:1 ratio by a member 159 160 of the research group. The skewed ratio of control and intervention schools was selected to ensure the feasibility of the study, as it was believed that a higher chance of being a control 161 school would have deterred some schools from joining the study <sup>26</sup>. For all participating 162 children, their own consent and written informed parental consent were obtained. The study 163 was approved by the Regional Committees on Health Research Ethics for Copenhagen and 164 Southern Denmark (J.no. H-16026885). 165

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## 167 **Program description**

168 "11 for Health in Denmark" is a health education programme in which the teaching takes 169 place on the football pitch designed for 10-12-year-old 5<sup>th</sup> grade children and is run in the 170 school by the children's regular teachers. It consists of two weekly 45-minute sessions over

an 11-week period. The teachers themselves choose which classes the sessions should replace 171 and one of the sessions is often conducted instead of physical education, while the other 172 replaces another subject. Each week the training focuses on delivering of one of ten health 173 messages, ending with a final round-up week (week 11) (Fig. 1). The programme combines 174 health education and PA designed as small-sided games or technical drills in small groups 175 (e.g. dribbling without hitting cones that represent cigarettes). The "11 for Health in 176 Denmark<sup>22</sup> sessions aim at a high level of physical activity for all those involved and include 177 team exercises, but also group discussions on health topics. With few players per ball, the 178 children's level of involvement in the games is higher and gives a higher rate of success 179 compared to normal team-sport activities <sup>27</sup>. A key element of each session is the concept of 180 praise partners. Each week the children get a new praise partner, and at the end of each "11 181 for Health in Denmark" session praise partners briefly get together to praise each other's 182 contribution to the session. 183

184

#### 185 Design

The study started in August 2016 and ended in December 2018. In order to fit the "11 for 186 Health in Denmark" programme into the school year, the programme either started in August 187 or September and ended in November or December, or started in February or March and 188 ended in May or June. The overall intervention consisted (in chronological order) of a 189 teachers' course, baseline testing, the 11-week intervention "11 for Health in Denmark" (or, 190 for CG, regular education) and follow-up testing. The course for the teachers was held in 191 192 either August or January. It was a 2<sup>1</sup>/<sub>2</sub>-day course going through all the 22 "11 for Health in Denmark" sessions. A detailed "11 for Health for Denmark" manual was developed for the 193 teachers, describing every exercise and health topic for the 22 sessions. On the course, the 194 teachers were given the manual, footballs, cones and bibs to take back to their schools to 195 ensure they were well equipped to complete the education programme. The courses were 196 geographically spread across the three largest cities in Denmark (Copenhagen, Aarhus and 197 Odense) to ensure geographical diversity. The course instructors were research staff from the 198 University of Southern Denmark, along with staff from the Danish Football Association 199 200 (DBU).

The questionnaires used in this study were part of a test battery including body composition, aerobic fitness, blood pressure and cognitive function, which will be described in future publications with a focus on physiology. During the intervention period, IG completed the 11week "11 for Health in Denmark" programme, consisting of two 45-min sessions, further described below. In the same period, CG continued with their usual physical education.



## 208 Measurements

## 209 Questionnaire with basic information

In the questionnaire, the children answered general biographical questions, e.g. age, country
of birth, language at home, parents' employment status (employed/unemployed) and leisuretime sporting activities (Yes/No. If yes: which sport?).

213 KIDSCREEN

A Danish version of the generic KIDSCREEN-27 questionnaire was used to measure self-214 reported health-related quality of life (HRQOL)<sup>28</sup>. The questionnaire is based on WHO's 215 definition of quality of life. KIDSCREEN-27 is multidimensional and comprises 27 items 216 covering five dimensions, including "physical well-being" (5 items; e.g. "In general, how 217 would you say your health is?"), "psychological wellbeing" (7 items e.g. "Thinking about the 218 last week has your life been enjoyable?", "peers and social support" (4 items e.g. "Thinking 219 about the last week have you had fun with your friends?" (4 items) and "school environment" 220 (4 items e.g. "Thinking about the last week have you been happy at school?". In our version, 221 we excluded the dimension "autonomy and parents (7 items) as no changes were expected in 222 this aspect based on the intervention and to minimise the number of questions the children 223 had to answer. The items are rated on a five-point Likert scale ranging from "never" to 224 "always" or "not at all" to "extremely". The standardised scores for the subscales are 225 specified to have a mean of approximately 50 and a standard deviation of approximately 10. 226 Higher scores indicate a better HRQOL. 227

KIDSCREEN-27 has previously shown good reliability (Cronbach's alphas 228 0.80-0.84) and good test-retest reliability <sup>29</sup>. 229

230

Statistics 231

All analyses were carried out using the R statistical software (version 3.6.1, R Core Team, 232 Vienna, Austria). Demographic characteristics and results of the KIDSCREEN questionnaire 233 are reported as mean±SD. Differences between groups in age, weight, height, BMI and gender 234 were analysed using a model-based t-test. The 'language at home' and 'parental employment 235 status' distributions were analysed using a chi-square test. The analysis of the four 236 KIDSCREEN scales was conducted using four separate linear mixed models with 237 group\*time, age, BMI and gender as fixed effects. Random effects of subject and class were 238 added to the model to account for variation between measurements. For the subgroup analysis 239 of gender, the same statistical procedure was followed, but without gender as a fixed effect. 240 For visual model validation, residual plots and normal probability plots were conducted. 241

In order to answer the research question, comparisons between and within 242 groups were analysed using a global F-test, and linear mixed model-based t-tests were used 243 for pairwise comparisons. To adjust for multiplicity of the pairwise comparisons, a "single-244 step" adjustment was carried out. The applied significance level was 0.05. 245

246

#### Results 247

A few significant demographic differences were found between IG and CG at baseline. IG 248 was approximately one month older (p<0.001), and 0.5 cm taller, while (p=0.03), IG girls had 249 0.3 kg/m<sup>2</sup> lower BMI (p=0.03) than CG girls. No differences were found for gender 250 distribution, language at home, parental employment status or body weight. The demographic 251 characteristics of IG and CG are shown in Table 1. The mean score and standard deviation of 252 the four KIDSCREEN subscales pre, post and delta values for the intervention period are 253 presented in Table 2. Reliability scores for the KIDSCREEN subscales pre and post 254 intervention range from 0.77 to 0.85 and are reported in Table 3. 255

256

*Physical well-being* 257

No differences were found in physical well-being between the groups at baseline. A betweengroup difference was found in the change score for physical well-being in favour of IG (p=0.02). Both boys and girls in IG improved physical well-being (p<0.001), while CG was unchanged. Between-group differences were observed in change scores for physical wellbeing in favour of IG girls compared to CG girls (p=0.006), whereas no significant betweengroup difference was observed for boys (Table 2).

- 264 265
- 266 *Psychological well-being*

No baseline difference was found between IG and CG in psychological well-being at baseline.
No changes were found for psychological well-being over time or between IG and CG (Table
269 2).

270

271 *Peers and social support* 

No differences were found between the groups at baseline with regard to peers and social support. Between-group differences were found in change score for peers and social support in favour of IG (p=0.048). Only the IG girls significantly improved on peers and social support (p=0.016), but no between-group difference was found when comparing the change with CG (p=0.09). No differences were found for boys in IG and CG (Table 2).

277

278 School environment

279 No differences were found between the groups at baseline with regard to school environment.

Both IG and CG improved their perception of the school environment within the groups. Nobetween-group difference was found (Table 2).

283

282

284 Discussion

The aim of the present study was to investigate the effects of the school activity and health education programme "11 for Health in Denmark" on multidimensional well-being in 10–12year-old Danish children. In the following discussion, we will outline factors of the "11 for Health in Denmark" programme that might have impacted the children's well-being. The programme consists of a multicomponent design including both PA and education, e.g. focusing on positive thinking. It is therefore not possible to single out the effectiveness of a specific aspect of the programme. There may be many reasons why girls benefited more from the programme than boys, and this will be discussed too.

293

# 294 *Physical well-being*

A significant increase in physical well-being was found for both boys and girls in IG. No significant change in physical well-being was found for CG. When comparing the development of IG vs CG, the change was only significant for the girls, not for the boys.

We have no evidence that the PA level was different between groups throughout 298 the intervention period, as we have no objective measure of the children's daily PA. However, 299 one of the programme's aims is to increase high-intensity PA and this might have resulted in 300 301 IG children being more physically active compared to CG children. In a PA study of 9-11year-old children, children very similar to the ones in our intervention who meet the 302 recommendation for daily physical activity have higher well-being scores compared to less 303 active children <sup>30</sup>. The "11 for Health in Denmark" programme might increase the PA level 304 305 during break-times, as the children are practising their football skills. Nielsen et al. (2015) found higher levels of PA in 9-10-year-old children playing football, as their leisure-time 306 sporting activity compared to other leisure-time sporting activities and children not involved 307 in any leisure-time sports. The authors found that half of the difference in total PA could be 308 explained by higher levels of PA during break-times <sup>31</sup>. Since the "11 for Health in Denmark" 309 programme has football as the main PA, this might cause an increase in activity during break-310 times and leisure time. 311

Another explanation for the positive changes in the physical well-being score 312 might be the higher exercise intensity. High intensity exercise has been associated with 313 increasing levels of endorphins which enhance positive feelings. But also psychosocial 314 315 mechanisms, including social interaction and mastery may play a role in enhancing wellbeing <sup>8</sup>. One of the aims of "11 for Health in Denmark" is to conduct drills and SSG at high 316 intensity. Previous studies in children have shown that small-sided games (SSGs) of football, 317 hockey and basketball elicit high heart rates (HR); higher than other activities like parkour 318 and circuit training <sup>32</sup>. However, less is known about the relationship between PA intensity 319 level and wellbeing. A recent study found a positive association between time spent in 320

objectively measured vigorous activity and well-being and positive and negative affect in 8<sup>th</sup> grade adolescents <sup>8</sup>. Furthermore, the study found that up to 36 min of vigorous activity was associated with a higher positive affect and up to 37 min was beneficial for a lower negative affect, and the association for negative affect was more pronounced for girls. The SSGs aiming for high intensity in the "11 for Health in Denmark" programme may therefore add to increased physical well-being.

327

## 328 Psychological well-being

No changes were found in psychological well-being. This was surprising since the review by 329 Liu and colleagues (2015) found that increased PA enhanced psychological well-being in 330 331 children and adolescents. A relatively large proportion of the studies included in the review by Liu et al. (2015) dealt with overweight children or children with different disorders which 332 333 is not the case for the majority of the children in this study. This might be an explanation for why psychological well-being did not increase in this study. The pilot study by Fuller et al. 334 335 (2016) did not find improvements using a similar subscale indicating that the "11 for Health in Denmark" does not impact the children's psychological well-being <sup>20</sup>. 336

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## 339 *Peers and social support*

The increase in the well-being subscale for peers and social support may be related to the 340 inclusive nature of SSGs and technical drills, which are performed in small teams, where 341 teamwork and social interaction are important. In team sports, participants are more likely to 342 feel a higher degree of social cohesion, and team sports create a stronger feeling of belonging 343 to a group because of the nature of the sports and their interactions <sup>16</sup>. Team sports can be 344 defined as a PA in which a group works together to achieve a common goal <sup>33</sup>, which might 345 346 be beneficial to social relations compared to individual sports. A review by Eime et al. (2013) investigated psychological benefits of sports in young people and found that those 347 participating in team sports had improved psychological health outcomes <sup>15</sup>. The finding is 348 supported by Vella et al., who investigated the relationship between health-related quality of 349 350 life and sport in children and found team sports to be more beneficial than individual sports <sup>34</sup>. Furthermore, a study comparing psychological well-being and self-perception for a team sport 351 352 (hockey) and individual PA (fitness-centre training) found that the group participating in team

sport scored better on relationships with others, sports competence and importance of sport 353 than the group engaged in individual PA <sup>35</sup>. These studies suggest that team sport is more 354 beneficial in terms of psychological health than individual sports, and this might also be the 355 case for school-based PA studies like "11 for Health in Denmark". The concept of praise 356 partners might also affect the subscale for peers and social support. A study by Corpus and 357 Lepper (2007) investigated the effect of three types of teacher praise (person, product and 358 process) and neutral feedback on 4th and 5th grade boys and girls. Girls showed increased 359 motivation after receiving two types of praise (product and process praise), but decreased 360 motivation after receiving person praise. On the other hand, boys did not show any change in 361 motivation after the three types of praise or neutral feedback <sup>36</sup>. The study only used a small 362 sample and the praise was given by the teacher, whereas in our study it was given by a 363 classmate. Nevertheless, the concept of praise partners might explain why girls in our study 364 tended to score better on the peers and social support subscale. 365

366

## 367 School environment

We are unable to explain the relatively big improvements in school environment for both IG and CG. As far as we know, no structural changes occurred in the Danish school system that might explain the changes. These results might indicate that school-related well-being increases with age in 5<sup>th</sup> grade regardless of any intervention.

372

## 373 *Gender differences*

In addition to differences between IG and CG, the study also identified some gender 374 differences. The girls benefited more from the programme than the boys, as they had within-375 group improvements for the subscale peers and social support and improved their physical 376 well-being compared to CG. The peers and social support subscale of well-being was 377 improved for IG between groups when all participants were included, but only IG girls had a 378 379 within-group improvement and a tendency towards a between-group difference. The reason for the girls' improvements could be that Danish girls aged between 10 and 12 are less active 380 than boys <sup>37</sup>, and the intervention may therefore have increased the level of PA relatively 381 more for the girls. If PA increased, it could be due either to the "11 for Health in Denmark" 382 sessions or to increased activity in break-times or leisure time. In Denmark, 53% of boys 383 indicate that they play football, compared to only 20% of girls <sup>38</sup>. The use of football in the 384

intervention may have encouraged more girls to play football in their break-times and leisure time, thereby increasing their level of PA more than for the boys. The girls might also have experienced a more pronounced effect of the high-intensity PA, as they generally engage in less high-intensity PA than boys <sup>37</sup>.

389

#### 390 Strengths and limitations

This study has strengths and limitations that need to be addressed. The study's strengths are 391 the large sample size, the use of cluster randomisation and the fact that the study was 392 conducted in the children's daily environment. Other strengths are the course conducted for 393 the teachers and the detailed manual provided. This ensured that the teachers had seen and 394 395 tried out the full programme before teaching their own students, thus giving the teachers 396 confidence to deliver the intervention. This probably also led to the teachers adhering more diligently to the manual and the content of the intervention. However, the interventions were 397 not supervised, so we cannot be sure that all teachers adhered to the manual during the 11 398 weeks. Since the teachers conducted the programme, they have the option to reuse the 399 programme with future classes and thereby continue the programme in a low-cost way, 400 ensuring long-term sustainability. 401

A limitation of the study was the demographic differences at baseline, even 402 though they were accounted for as fixed effects in the statistical analysis. Moreover, we have 403 no objective measures of the daily PA and are therefore not able to determine whether IG had 404 higher levels of PA or higher-intensity PA than CG in the intervention period, which could 405 406 have led to the changes in well-being. Use of accelerometers or other types of objective PA measurements would also give us the possibility to investigate if the girls increased their PA 407 408 and PA intensity more than boys, which could be an explanation for the girl's improvements in physical well-being. Future studies should investigate whether the "11 for Health in 409 410 Denmark" programme makes any difference to PA by objective measurement of daily PA. Last but not least, due to the programme's multicomponent design it is not possible to single 411 412 out the underlying mechanisms and we cannot determine whether the improvements were related to changes in the physical activity pattern or to socio-psychological changes. 413

414

415 Conclusion

The intervention programme "11 for Health in Denmark" had a positive effect on physical 416 well-being in girls, whereas no change was found in boys. The overall scores for peers and 417 social support improved during the intervention period, but no subgroup differences were 418 found.. The positive change in girls' physical well-being could potentially be explained by the 419 girls' lower PA levels and lower football skills prior to the intervention, while the positive 420 change for peers and social support might be explained by the praise partner concept and 421 many small group activities. From a practical perspective, the "11 for Health in Denmark" 422 programme seems to be effective for improving well-being in Danish 5th grade children, but 423 the underlying mechanisms of the improvements cannot be outlined yet. Future studies are 424 needed to evaluate whether the "11 for Health in Denmark" programme increases general PA 425 or the intensity of PA in comparison to a control group. 426

427

## 428 Perspectives

The "11 for Health in Denmark" programme can contribute to increased well-being in 5<sup>th</sup> grade children and will hopefully be used in the future for 5<sup>th</sup> grade children. Further research should investigate the mechanisms behind the positive findings, for example by objectively measuring the children's PA level before, during and after the intervention. Future studies of the children's health in relation to the intervention would also be very interesting.

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547 548 549 550 Figure

Figure 1 "11 for Health in Denmark" programme: session activities, health messages and topics				
Week	´Play Football´	'Play Fair' health	Session tonics	
	activity	message		
1	Warming up	Play football	Prepare for exercise and sport	
2	Passing	Respect others	Respect and help others and	
			avoid bullying	
3	Goalkeeping	Be active	Walk, cycle, use the stairs in daily	
			life	
4	Dribbling	Avoid drugs, alcohol and	Avoid unhealthy addictions	
		tobacco		
5	Controlling the ball	Control your weight	Control the quantity of food	
			eaten	
6	Defending	Wash your hands	Develop good hygiene	
7	Trapping	Drink water	Drink water instead of soft drinks	
8	Fitness training	Eat a balanced diet	Train and eat a varied diet	
9	Overlapping	Keep fit	Do vigorous exercise	
10	Shooting	Think positively	Have a positive mindset	
11	Teamwork	Fair play	Review all health issues	

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#### 552 Tables

Table 1. Demographic characteristics for the intervention group (IG) and control group (CG)				
	IG	CG		
Number of participants (N)				
All	2533	528		
Boys	1259	268		
Girls	1274	260		
Gender (% boys)	49.7	50.8		
Age (years)				
All	$11.5\pm0.4\text{*}$	$11.4\pm0.5$		
Boys	$11.5\pm0.5\texttt{*}$	$11.5\pm0.5$		
Girls	$11.5\pm0.4\texttt{*}$	$11.4\pm0.4$		
BMI (weight/height <sup>2</sup> )				
All	$18.4\pm3.0$	$18.4\pm3.0$		
Boys	$18.3\pm2.9$	$18.1\pm2.8$		
Girls	$18.4\pm3.0\texttt{*}$	$18.7\pm3.3$		
Weight (kg)				
All	$42.3\pm8.8$	$42.1{\pm}9.1$		
Boys	$42.3{\pm}~8.6$	41.6± 8.9		
Girls	$42.3{\pm}9.0$	$42.7{\pm}~9.4$		
Height (cm)				
All	$151.3\pm7.2\texttt{*}$	$150.8\pm7.3$		
Boys	$151.4\pm7.0$	$151.0\pm7.0$		
Girls	$151.3\pm7.4$	$150.6\pm7.6$		
Language at home				
Only Danish (boys/girls) (%)	76 (76/76)	75 (78/72)		
Danish and one other language (boys/girls) (%)	22 (21/22)	23 (20/25)		
Only another language (boys/girls) (%)	2 (2/2)	2 (2/3)		
Parental employment status				
Mother in work (boys/girls) (%)	87 (86/88)	86 (87/85)		
Father in work (boys/girls) (%)	92 (92/93)	92 (94/90)		
Sports participation				
Participation in leisure time sport (boys/girls) (%)	81 (80/82)	81 (82/78)		
Data reported as raw mean $\pm$ SD. * = Significant different from	<i>CG. P</i> ≤0.05.			

					ps of 5035 and	8		
		]	IG	(	CG		Change	
							score (Δ)	
		Pre	Post	Pre	Post	ΔIG	ΔCG	IG vs CG
Physical wellbei	ng							
All		$49.5\pm9.1$	$51.1\pm9.6\texttt{*}$	$49.9\pm9.7$	$50.5\pm10.1$	1.6	0.6	1.0\$
Boys		$50.5\pm9.5$	$52.0\pm9.8\texttt{*}$	$51.3\pm10.0$	$52.3\pm10.4$	1.5	1.0	0.5
Girls		$48.6\pm8.5$	$50.2\pm9.3\texttt{*}$	$48.5\pm9.4$	$48.7\pm9.4$	1.6	0.2	1.4\$
Psychological w	ellbeing							
All		$51.9\pm9.5$	$52.1\pm9.8$	$51.7\pm9.6$	$52.0\pm9.5$	0.2	0.3	-0.1
Boys		$53.3\pm9.7$	$53.4\pm9.5$	$53.3\pm9.4$	$54.1\pm9.6$	0.1	0.8	-0.7
Girls		$50.5\pm9.2$	$50.8\pm9.9$	$50.1\pm9.7$	$49.8\pm8.8$	0.3	-0.3	0.6
Peers and social	eers and social support							
All		$50.2\pm10.2$	$50.8\pm10.1\texttt{*}$	$50.6\pm10.1$	$50.2\pm9.9$	0.6	-0.4	1.0\$
Boys		$50.5\pm10.1$	$51.0\pm10.0$	$51.2\pm10.1$	$50.9 \pm 10.0$	0.5	-0.3	0.8
Girls	U	$50.0\pm10.3$	$50.6\pm10.2*$	$50.0\pm10.0$	$49.4\pm9.7$	0.6	-0.6	1.2
School environn	nent							
All		$48.5\pm7.4$	$52.5\pm9.1\texttt{*}$	$48.4\pm7.6$	$52.4\pm9.1 \texttt{*}$	4.1	4.0	0.1
Boys		$48.3\pm7.3$	$52.1\pm9.1\texttt{*}$	$48.4\pm7.8$	$52.6\pm9.6*$	3.8	4.2	-0.4
Girls		$48.6\pm7.4$	$53.0\pm9.1*$	$48.4\pm7.4$	$52.1\pm8.5*$	4.4	3.7	0.7

#### Table 2 | KIDSCREEN well-being score for all children, and in subgroups of boys and girls.

Data reported as raw mean $\pm$ SD. IG, intervention group; CG, control group. \* = Significant within-group difference. \$ = Significant delta between-group difference. \$ = 0.05.



## Table 3. Reliability of the KIDSCREEN well-being subscales

	Pre intervention	Post intervention
Physical Well-being	0.77 (n = 3061)	0.80 (n = 3061)
Psychological Well-being	0.80 (n = 3061)	0.82 (n = 3061)

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Peers and Social Support	0.84 (n = 3061)	0.85 (n = 3061)
School Environment	0.76 (n = 3061)	0.80 (n = 3061)

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Figure 1 "11 for Health in Denmark" programme: session activities, health messages and topics				
Winnik:	'Play Faotbell' activity	'Hey fair' health message	Session topics	
1	Warnity.up	Playfoothel	Prepare for exercise and sport	
ž	Fassing	Respect others	Respect and help others and avoid fullying	
3	Scalkasping	Re at the	Walk, cycle, use the stairs in daily life	
4	D-thring	Avoid drugs, alcohol and Tobacco	Archi university etilition	
5	Controlling the half	Control your weight	Control the qualitity of food eaters	
Б	Delencing	Wash your bends	Developgissd hygiere	
2	Trapping	Drick water	Drink water Instead of soft drinks	
8	Fitness training	Fat e belon ed diet	Train and sort a varied dist	
5	Overlapping	Keepit	Do signeous exercise	
10	Showing	Thins positizely	Have a positive mindset	
11	Teenwork	Farples	Review all beolth issues	

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