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

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Abstract

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

Method: 3061 children were randomly assigned to an intervention group (IG) or a control group (CG) by 5:1 cluster randomisation by school. 2533 children (mean age 11.5±0.4; 49.7% boys) were assigned to IG and 528 children (mean age 11.4±0.5; 50.8% boys) were assigned 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 participate in any intervention and continued with their regular education. Before and after the intervention period, both groups answered a shortened version of the multidimensional well-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±8.5 to 50.2±9.3), 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±10.2 to 50.8±10.1), 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.

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

Introduction

The World Health Organization (WHO) has identified mental health as one of the most important health concerns of the 21st century [1]. 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 [2]. If the challenges a person faces exceed their resources, this will negatively impact well-being, and vice versa [2]. 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 [3].

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

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

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 school-based settings. More well-controlled studies are needed [14].

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

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

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.

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

Methods

Participants

Schools from all over Denmark were issued with an invitation for their 5th grade classes to participate in the "11 for Health in Denmark" programme. A total of 3061 children (mean age 11.5±0.5 years) from 111 different Danish schools spread throughout Denmark completed the full questionnaires before and after the project and were thus included in this study. The study was designed as a cluster-randomised controlled trial with schools as the individual clusters [25]. The schools were randomly assigned to either a control group (CG) (20 schools, 528 children) or an intervention group (IG) (91 schools, 2533 children) in a 5:1 ratio by a member 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 school would have deterred some schools from joining the study [26]. For all participating children, their own consent and written informed parental consent were obtained. The study was approved by the Regional Committees on Health Research Ethics for Copenhagen and Southern Denmark (J.no. H-16026885).

Program description

"11 for Health in Denmark" is a health education programme in which the teaching takes place on the football pitch designed for 10-12-year-old 5th grade children and is run in the 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 and one of the sessions is often conducted instead of physical education, while the other replaces another subject. Each week the training focuses on delivering of one of ten health messages, ending with a final round-up week (week 11) (Fig. 1). The programme combines health education and PA designed as small-sided games or technical drills in small groups (e.g. dribbling without hitting cones that represent cigarettes). The "11 for Health in Denmark" sessions aim at a high level of physical activity for all those involved and include team exercises, but also group discussions on health topics. With few players per ball, the children's level of involvement in the games is higher and gives a higher rate of success compared to normal team-sport activities [27]. A key element of each session is the concept of praise partners. Each week the children get a new praise partner, and at the end of each "11 for Health in Denmark" session praise partners briefly get together to praise each other's contribution to the session.

Design

The study started in August 2016 and ended in December 2018. In order to fit the "11 for Health in Denmark" programme into the school year, the programme either started in August or September and ended in November or December, or started in February or March and ended in May or June. The overall intervention consisted (in chronological order) of a teachers' course, baseline testing, the 11-week intervention "11 for Health in Denmark" (or, for CG, regular education) and follow-up testing. The course for the teachers was held in either August or January. It was a 2½-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 teachers, describing every exercise and health topic for the 22 sessions. On the course, the teachers were given the manual, footballs, cones and bibs to take back to their schools to ensure they were well equipped to complete the education programme. The courses were geographically spread across the three largest cities in Denmark (Copenhagen, Aarhus and Odense) to ensure geographical diversity. The course instructors were research staff from the University of Southern Denmark, along with staff from the Danish Football Association (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 11-week "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.

Measurements

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 leisure-time sporting activities (Yes/No. If yes: which sport?).

KIDSCREEN

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

KIDSCREEN-27 has previously shown good reliability (Cronbach's alphas 0.80–0.84) and good test-retest reliability [29].

Statistics

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

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

Results

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

Physical well-being

No differences were found in physical well-being between the groups at baseline. A between-group 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 well-being in favour of IG girls compared to CG girls ($p=0.006$), whereas no significant between-group difference was observed for boys (Table 2).

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 2).

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).

School environment

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. No between-group difference was found (Table 2).

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 10–12-year-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.

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 the intervention period, as we have no objective measure of the children's daily PA. However, one of the programme's aims is to increase high-intensity PA and this might have resulted in IG children being more physically active compared to CG children. In a PA study of 9–11-year-old children, children very similar to the ones in our intervention who meet the recommendation for daily physical activity have higher well-being scores compared to less active children [30]. The "11 for Health in Denmark" programme might increase the PA level 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 sporting activity compared to other leisure-time sporting activities and children not involved in any leisure-time sports. The authors found that half of the difference in total PA could be explained by higher levels of PA during break-times [31]. Since the "11 for Health in Denmark" programme has football as the main PA, this might cause an increase in activity during break-times and leisure time.

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

objectively measured vigorous activity and well-being and positive and negative affect in 8th grade adolescents [8]. 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.

Psychological well-being

No changes were found in psychological well-being. This was surprising since the review by Liu and colleagues (2015) found that increased PA enhanced psychological well-being in 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 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. (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 [20].

Peers and social support

The increase in the well-being subscale for peers and social support may be related to the inclusive nature of SSGs and technical drills, which are performed in small teams, where teamwork and social interaction are important. In team sports, participants are more likely to feel a higher degree of social cohesion, and team sports create a stronger feeling of belonging to a group because of the nature of the sports and their interactions [16]. Team sports can be defined as a PA in which a group works together to achieve a common goal [33], which might 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 participating in team sports had improved psychological health outcomes [15]. The finding is supported by Vella et al., who investigated the relationship between health-related quality of life and sport in children and found team sports to be more beneficial than individual sports [34]. Furthermore, a study comparing psychological well-being and self-perception for a team sport (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 than the group engaged in individual PA [35]. These studies suggest that team sport is more beneficial in terms of psychological health than individual sports, and this might also be the case for school-based PA studies like "11 for Health in Denmark". The concept of praise partners might also affect the subscale for peers and social support. A study by Corpus and Lepper (2007) investigated the effect of three types of teacher praise (person, product and process) and neutral feedback on 4th and 5th grade boys and girls. Girls showed increased motivation after receiving two types of praise (product and process praise), but decreased motivation after receiving person praise. On the other hand, boys did not show any change in motivation after the three types of praise or neutral feedback [36]. The study only used a small sample and the praise was given by the teacher, whereas in our study it was given by a classmate. Nevertheless, the concept of praise partners might explain why girls in our study tended to score better on the peers and social support subscale.

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 5th grade regardless of any intervention.

Gender differences

In addition to differences between IG and CG, the study also identified some gender differences. The girls benefited more from the programme than the boys, as they had within-group improvements for the subscale peers and social support and improved their physical well-being compared to CG. The peers and social support subscale of well-being was improved for IG between groups when all participants were included, but only IG girls had a 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 than boys [37], and the intervention may therefore have increased the level of PA relatively more for the girls. If PA increased, it could be due either to the "11 for Health in Denmark" sessions or to increased activity in break-times or leisure time. In Denmark, 53% of boys indicate that they play football, compared to only 20% of girls [38]. The use of football in the

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 [37].

Strengths and limitations

This study has strengths and limitations that need to be addressed. The study's strengths are the large sample size, the use of cluster randomisation and the fact that the study was conducted in the children's daily environment. Other strengths are the course conducted for the teachers and the detailed manual provided. This ensured that the teachers had seen and tried out the full programme before teaching their own students, thus giving the teachers 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 not supervised, so we cannot be sure that all teachers adhered to the manual during the 11 weeks. Since the teachers conducted the programme, they have the option to reuse the programme with future classes and thereby continue the programme in a low-cost way, ensuring long-term sustainability.

A limitation of the study was the demographic differences at baseline, even though they were accounted for as fixed effects in the statistical analysis. Moreover, we have no objective measures of the daily PA and are therefore not able to determine whether IG had higher levels of PA or higher-intensity PA than CG in the intervention period, which could 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 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 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 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.

Conclusion

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

Perspectives

The "11 for Health in Denmark" programme can contribute to increased well-being in 5th grade children and will hopefully be used in the future for 5th 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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Figure

Figure 1 "11 for Health in Denmark" programme: session activities, health messages and topics

Week	´Play Football´ activity	´Play Fair´ health message	Session topics
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 tobacco	Avoid unhealthy addictions
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

Tables

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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 ± 0.4*	11.4 ± 0.5
Boys	11.5 ± 0.5*	11.5 ± 0.5
Girls	11.5 ± 0.4*	11.4 ± 0.4
BMI (weight/height^2)		
All	18.4 ± 3.0	18.4 ± 3.0
Boys	18.3 ± 2.9	18.1 ± 2.8
Girls	18.4 ± 3.0*	18.7 ± 3.3
Weight (kg)		
All	42.3 ± 8.8	42.1± 9.1
Boys	42.3± 8.6	41.6± 8.9
Girls	42.3± 9.0	42.7± 9.4
Height (cm)		
All	151.3 ± 7.2*	150.8 ± 7.3
Boys	151.4 ± 7.0	151.0 ± 7.0
Girls	151.3 ± 7.4	150.6 ± 7.6
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±SD. * = Significant different from CG. P≤0.05.*

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

	IG		CG		Change score (Δ)		
	Pre	Post	Pre	Post	ΔIG	ΔCG	IG vs CG
Physical wellbeing							
All	49.5 ± 9.1	51.1 ± 9.6*	49.9 ± 9.7	50.5 ± 10.1	1.6	0.6	1.0$
Boys	50.5 ± 9.5	52.0 ± 9.8*	51.3 ± 10.0	52.3 ± 10.4	1.5	1.0	0.5
Girls	48.6 ± 8.5	50.2 ± 9.3*	48.5 ± 9.4	48.7 ± 9.4	1.6	0.2	1.4$
Psychological wellbeing							
All	51.9 ± 9.5	52.1 ± 9.8	51.7 ± 9.6	52.0 ± 9.5	0.2	0.3	-0.1
Boys	53.3 ± 9.7	53.4 ± 9.5	53.3 ± 9.4	54.1 ± 9.6	0.1	0.8	-0.7
Girls	50.5 ± 9.2	50.8 ± 9.9	50.1 ± 9.7	49.8 ± 8.8	0.3	-0.3	0.6
Peers and social support							
All	50.2 ± 10.2	50.8 ± 10.1*	50.6 ± 10.1	50.2 ± 9.9	0.6	-0.4	1.0$
Boys	50.5 ± 10.1	51.0 ± 10.0	51.2 ± 10.1	50.9 ± 10.0	0.5	-0.3	0.8
Girls	50.0 ± 10.3	50.6 ± 10.2*	50.0 ± 10.0	49.4 ± 9.7	0.6	-0.6	1.2
School environment							
All	48.5 ± 7.4	52.5 ± 9.1*	48.4 ± 7.6	52.4 ± 9.1*	4.1	4.0	0.1
Boys	48.3 ± 7.3	52.1 ± 9.1*	48.4 ± 7.8	52.6 ± 9.6*	3.8	4.2	-0.4
Girls	48.6 ± 7.4	53.0 ± 9.1*	48.4 ± 7.4	52.1 ± 8.5*	4.4	3.7	0.7

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

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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)

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

Week	'Play Football' activity	'Play Fair' health message	Session topics
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 tobacco	Avoid unhealthy addictions
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
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9	Overlapping	Keep fit	Do vigorous exercise
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