

# Health experience outcomes of a health promotion project for middle school pupils in Sweden

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## Abstract

The aim was to examine middle school-aged pupils' participation in an action-oriented school health promotion project and investigate its effects on their health experience, learning and influence. A survey was sent eight times to middle school-aged pupils ( $n = 105$ ). A descriptive analysis with group comparisons was followed by a regression analysis. Health differences were found between gender and age. Aspects of pupil influence and learning about health showed positive progression during the project. Satisfaction with school performance was most associated with health experience. Thus, health experience, gender, and age are factors to consider when planning similar health promotion projects in schools.

## KEYWORDS

health promotion, learning, metacognition, middle school pupils, pupil influence

## INTRODUCTION

Education is one of the most important social determinants of health (Marmot, 2005; Viner et al., 2012), and children's health experience is connected to their ability to learn as well as their school performance (Langford et al., 2015; Inchley et al., 2016). Good physical, mental and social health can thus serve both to improve learning and as a goal of teaching and learning (Langford et al., 2015). Although physical activity is a basic human function, physical inactivity today is one of the greatest public health problems globally (Kohl et al., 2012; WHO, 2015). The time spent on physical activity therefore needs to increase in general and among children in particular, as physical activity has a direct

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positive impact on pupils' learning and learning outcomes (Ratey & Hagerman, 2013). From an international perspective, Swedish school children have fairly good physical health, but increasing physical inactivity has meant that obesity is becoming more common, and the incidence of mental health is worrying (Janssen & LeBlanc, 2010; Public Health Authority, 2018).

Children's mental health, represented by for instance stress and anxiety, has shown a negative trend in recent decades both nationally and globally (Inchley et al., 2016; Åström et al., 2018; Hagquist et al., 2019). Children with mental illness often achieve a lower level of education than their healthier peers (Gustafsson et al., 2010), and in Sweden, an increase in mental illness has occurred mainly among girls (Åström et al., 2018). For those who do not meet the school's set goals, there is a risk of being excluded, and not having approved grades that give access to higher education or the labour market, with adherent social contexts and support in adult age (Stengård & Appelqvist-Schmidlechner, 2010).

Social support from family and a sense of belonging to other social groups are positive determinants of health (Berkman & Glass, 2000; Viner et al., 2012), and Swedish children report that they have good relations with their family and friends (Public Health Authority, 2018). During the middle school years, the social world of children expands, and friends become increasingly important and have an impact on children's self-worth and health (Maunder & Monks, 2019). School factors that promote children's health include both social factors, such as participation in a joint context and good relations with teachers and classmates, and individual factors, such as self-perception, competence and participation in and satisfaction with learning situations (Bonell et al., 2013; Maunder & Monks, 2019). Active participation in class is thus another resource that can strengthen pupils' mental health and also motivation for learning. Motivation and commitment to actively participate, as well as a sense of coherence in education has a positive impact on learning, which, in turn, can positively affect health (Ozer et al., 2010). There is only limited research focusing on pupils' school relationships and influence, for example, regarding teaching factors, organisational factors, activities in class and with classmates (Gustafsson et al., 2010).

Pupil influence in health promotion projects in schools is beneficial for the health resources for pupils' learning and achievement in school (Nilsson Lindström & Bringsén, 2021). However, the implementation of health promotion activities and projects in schools is usually carried out separately from teaching. In Sweden, health-related projects or activities are often handled by the school health care team, and previous research has shown limited opportunities for school nurses to undertake health promotion in schools at a group level (Larsson et al., 2014).

There is need for a whole school approach in which pupils' health, school performance and influence are seen to be mutually dependent (Rowling, 2009). Therefore, for health promotion in schools to be successful, pupils influence and cooperation between different school professions in health promotion projects are needed (Reuterswärd & Lagerström, 2010). Thus, an action-oriented approach in school health promotion projects is required, as it includes pupils as active participants in the whole project process, beyond being just recipients of knowledge. A participatory action-oriented model for health promotion practice and research in a school setting is useful and related to positive experiences among both participating pupils and teachers (Nilsson Lindström & Bringsén, 2021). This model is also in line with the rules of the United Nations Convention on the Rights of the Child, which is also part of Swedish legislation (Act 1197 of 2018) and therefore important to consider when implementing health promotion projects in Swedish schools. The four fundamental principles in the law are: (1) all children have the same right to participate; (2) the best interest of the child should be in focus; (3) every child has the right to develop and (4) children have the right to express their views in all matters that concern them (Government Offices of Sweden, 2020). An action-oriented approach to health promotion in schools creates good conditions both for increased health experience and learning and for pupil influence during the setting of project goals and the project process.

The aim of this study was to examine middle school-aged pupils' participation in an action-oriented school health promotion project and investigate its effects on their health experience, learning and influence.

## METHOD

### Context and project description

This study was part of a larger action-oriented health promotion project, meaning that the principles for action research were as adopted for the research project. Action research is performed in close collaboration with practice, and the purpose is to understand and improve practice based on a scientific approach (Fals-Borda, 1991; Stringer & Genat, 2004). The action-oriented model (Nilsson Lindström & Bringsén, 2021) in this project aimed to increase pupil influence by their participation in all project steps, through giving the pupils the possibility to express their opinion, be listened to and listen to others and be involved in and influence planning. The action-oriented model consists of a support group, a project group, activities in classes and a focus group with teachers. The *support group* consisted of researchers, the school principal, a municipality representative, representative from the school health care team (either school nurse, school physician, special teacher, school curator or school psychologist), teachers and three or four pupils. The support group met twice a term during the project to discuss project implementation and the progress of metacognition about health and learning in relation to different project activities. The *project group* comprised six pupils, teachers, a school health care team and researchers. The project group met every six weeks to discuss and reflect on the implementation of activities at class level and changes throughout the project. The researchers provided reports on the project findings, both quantitative and qualitative, continuously during the project period, and these were discussed in the different project forums. The participating *classes* and their teachers carried out in-class activities every day and reflections about the activities every week, and in that way, both qualitative and quantitative data were collected. At the end of the project, *focus groups* with the teachers were conducted to capture the teachers' experiences of participating both in the reflection forums and in the project as a whole.

This project was conducted in a countryside school in southeast Sweden during 2018 and started with school representatives inviting us researchers into school to cooperate in a health promotion project. The school, from preschool to 9th grade, has 320 pupils and 30 employees. Only the middle school pupils (grades 4–6) and their teachers participated in the health promotion project. The project activities were conducted from February to May 2018. The main purpose of the health promotion project was for the middle school to develop and implement a multidisciplinary thematic health intervention to increase metacognition about health and learning among the pupils. The intervention meant that the teachers included health (different aspects of physical, mental and social health) as a running theme when teaching language development, natural science, mathematics, aesthetics and physical education every week. The health themes were (1) the body's external and internal structure and function; (2) physical and mental health and ill health and (3) puberty, sexuality and the development of life. During the project, the teachers collaborated in a different way than they had before, for example, they designed common tasks where they could co-assess tasks instead of working on them separately. The secondary purpose of the health promotion project was also to increase pupils' influence and understanding about their own learning, and more varied working and teaching methods were implemented for the pupils to experience their best way of learning in different subjects. For example, through listening to podcasts, watching videos, reading digital media, working while standing,

walking classroom, brain breaks (short active breaks from learning during class), working outside the classroom and more.

The project included both qualitative and quantitative research studies. One qualitative study focussed on the pupils' metacognition about health, learning and pupil influence through the project teaching activities. Qualitative data were collected in a logbook recording weekly individual reflections about the activities, and how the pupils experienced their own learning in relation to health and school performance. These qualitative results will be presented in a forthcoming article. The other qualitative data collection was concerned with the action-oriented research process, where pupils, teachers, the school health team and researchers collaborated throughout the project in various reflection forums. The findings of the project process from the action-oriented work model, with reflection forums at different levels (support group, project group and focus group), have been described in a published paper (Nilsson Lindström & Bringsén, 2021). The quantitative data collection was a weekly web-based questionnaire with the pupils, which was administered during school hours, and it is the result from this study that is presented in this paper.

## **Ethical approval and consent statement**

An information letter about the research was sent to the pupils and their parents/legal guardian, informing them that they could actively decline to give permission for their children to participate. Moreover, participation was voluntary for the pupils, and they actively accepted or declined participation by answering, or not answering, the questionnaire when administered. Therefore, the pupils were not forced to participate even if their parent/legal guardian had given permission. The research followed the Swedish law for research ethics (SFS 2003:460) and was approved by the Regional Ethical Review Board in Lund, Sweden (Dnr: 2018/254).

## **Study participants and survey process**

All pupils ( $n = 105$ ) in grades 4–6 were invited to participate in the quantitative research study. To ensure an equal opportunity to participate, the study took place during school hours. In Sweden, grade 4 pupils are 10–11 years old, grade 5 are 11–12 years old and grade 6 are 12–13 years old. At baseline, 31 girls and 54 boys (in total 81%) participated compared to 35 girls and 38 boys (in total 69.5%) at the follow-up occasion. The number of pupils in each grade ranged from 19 to 38. Each week, a web-based anonymous questionnaire was sent to all pupils via their school email address. The teacher summarised the week's activities within the project every week as a reminder for the pupils. The pupils completed the questionnaire eight times in total during a period of 11 project weeks, including interrupted periods such as holidays and study days when the pupils were not in school throughout the project period. The response rate during the weeks ranged from 69.5% ( $n = 73$ ) to 84% ( $n = 88$ ). In total, the response rate over the weeks was 79.5% ( $n = 667$ ).

## **Survey questionnaire**

To investigate the effects of participating in an action-oriented health promotion project on pupils' health experience, the measured variables were connected to metacognition about health, pupil influence and learning. The web-based questionnaire survey consisted of three parts. The first asked about

gender and grade (4–6). The second part consisted of four statements related to the pupils' experience of learning, and their influence in the project activities during the previous week: (1) 'The project activities have made me learn more about health'; (2) 'The project activities have made me more aware of how I learn (why I learned and what I learned about health)'; (3) 'I feel that I have the opportunity to influence the project activities (e.g., what has been done, how it was done or when it was done)' and (4) 'I am satisfied with my school performance this week'. Pupils rated the four statements on a four-point Likert scale ranging from 'Agree' to 'Disagree' and, regarding the fourth statement, also answered an open question: 'Explain/develop your answer about how satisfied you are with your school performance this week, and why'. Also, the second part of the questionnaire contained a multiple-choice question about pupil influence: 'Check all the answers that describe what you experienced during the week regarding the project activities'. The answers were: 'I feel I participated'; 'I took responsibility'; 'Other pupils have listened to me'; 'I have been involved in planning'; 'I have expressed my opinion'; 'Teachers have listened to me' and 'I have listened to others'. The third part of the questionnaire was about subjective health experience and was partly based on the Salutogenic Health Indicator Scale (SHIS) (Bringsén et al., 2009). The overall question was modified from the original version of the SHIS to make it suitable for children of this age group: 'Check what best describes how you feel today'. Pupils scored their answers on a four-graded semantic differential with respect to the following feelings: alert – tired; happy – sad; calm – stressed; healthy – sick; energetic – tired and focused – unfocused. To ensure valid content, the survey questionnaire was discussed with the participants, both pupils and teachers, in a process of member-checking before data collection started (Stringer & Genat, 2004).

## Statistical analysis

In this quantitative study, the data collection was carried out on a weekly basis, inspired by repeated Experience Sampling Form (Hektner et al., 2007). The data were analysed in several phases, and therefore, the *n*-values presented in the tables correspond to the number of people completing the questionnaire on the analysed measurement occasions, but always at a group level. Individual-level data and response-level data were analysed separately. Individual-level data were used in group comparisons between baseline and follow-up, and response-level data was used in the cross-sectional analysis. It is recommended to use individual-level data for repeated measures (Hektner et al., 2007); however, the small number of respondents limited the possibility for sophisticated analysis of the data at an individual level.

A descriptive first phase was followed by a regression analysis. In the group comparison phase, variables of interest were gender, grade and the following experiences: 'Other pupils have listened to me', 'Teachers have listened to me', 'I feel I have participated', 'I have expressed my opinion', 'I took responsibility', 'I have listened to others', 'I have been involved in planning', 'I have the opportunity to influence project activities', 'The project activities have made me learn more about health' and 'I am satisfied with my school performance this week'. All experience variables were categorical, most with nominal 'Yes/No' answers, while some had ordinal-level responses with four response categories ranging from 'Strongly disagree' to 'Strongly agree'. The ordinal-level variables were dichotomised into 'Agree' and 'Disagree' for all analyses from descriptive analysis, using Pearson's chi-squared test, to group comparisons, using analysis of variance (ANOVA) and logistic regression analysis. All variables were checked for underpinning assumptions before choosing the relevant statistical analysis.

The question about subjective health experience was merged into a health index and was the dependent variable (DV). Cronbach's alpha for the health index was 0.77. The DV was dichotomised into

‘High health experience’ (19–24 points) and ‘Low health experience’ (6–18 points). Cut-offs were decided based on the distribution of the variable. A total of 28 internal dropouts were analysed, showing that data were missing completely at random ( $p = 0.390$ ). The missing values were replaced with the mean value for the whole population, namely 18.62, and thereafter randomly rounded to either 18 or 19. This resulted in half, that is, 14, of the cases being rounded to 18 and the remaining 14 cases being rounded to 19 to enable the cases to be included in either of the groups 6–18 and 19–24.

SPSS for Windows, version 26, was used to run the analyses (IBM). Statistical significance was decided at a  $p \geq 0.05$ , while statistical indication was set at  $p < 0.05 \leq 0.1$ . For group comparisons, chi-squared tests, ANOVA, Mann-Whitney U-test and Kruskal-Wallis test were used.

## RESULTS

A comparative number of pupils participated in all planned project activities and the corresponding measurement occasions every week. Descriptive results of mean values regarding health experience between baseline and follow-up ( $p = 0.672$ ), between gender ( $p = 0.040$ ) and between grades ( $p = 0.000$ ) were both non-significant and significant. Comparing the characteristics and experiences of the respondents in relation to the rating of their health experience (dichotomised into ‘high health experience’ and ‘low health experience’), we found no significant differences between low or high health experience at baseline and at follow-up ( $p = 0.144$ ) or between the gender of participants at baseline and that of participants at follow-up ( $p = 0.456$ ). However, statistically significant associations between health experience and different grades ( $p < 0.001$ ) showed that younger pupils (in grades 4 and 5) had a higher health experience compared to older pupils (grade 6). The proportion of pupils who reported high health experience also indicated a positive experience regarding the variables of other pupils having listened to them, teachers having listened to them, having participated, having expressed their opinion, having been involved in planning, having learned more about health, having an awareness of how they learned, having the opportunity to influence the activities and being satisfied with their school performance that week (all  $p < 0.001$ ). Similarly, pupils who reported having taken responsibility ( $p = 0.033$ ) and those who had listened to others ( $p = 0.005$ ) also reported high health experience (Table 1).

Furthermore, the logistic regression analysis revealed significant associations between pupils’ health experience and satisfaction with their school performance ( $p = 0.009$ ), and this variable also had the highest Wald value (6.895) and therefore contributed most to the model. Pupils’ experience of the possibility to express their opinion ( $p = 0.027$ ) was also significantly related to their health experience. The variable with the highest odds ratio (OR) (1.633; 95% confidence interval [CI] 0.735–3.628) was the follow-up measure (compared to the baseline measure) of health experience, although not statistically significant. Experiences of having participated, having taken responsibility and having the ability to influence the project activities had slightly, but not significantly, increased ORs (1.078, 1.229 and 1.015, respectively). The variables included in the regression model explained almost 31% (0.309) of the variation in experienced health (the DV) (Table 2).

The group comparison between baseline and follow-up revealed a tendency of positive results, though not statistically significant, with a smaller proportion of pupils, both boys and girls, reporting low health experience at follow-up, and furthermore, an increase in girls reporting high health experience at follow-up. The group comparison between baseline and follow-up showed an increase in the number of pupils with high health experience among those who also perceived that others listened to them ( $p = 0.021$ ) and that they could express their opinions ( $p = 0.011$ ). On the other hand, among

**TABLE 1** Sample characteristics presented in row percentages ( $n = 667$ )

Variable	Low health experience, n (%)	High health experience, n (%)	<i>p</i> -Value*
Measurement point			0.144
Baseline, $n = 85$	46 (54)	39 (46)	
Follow-up, $n = 73$	31 (43)	42 (57)	
Gender			0.456
Boy	182 (45)	221 (55)	
Girl	127 (48)	137 (52)	
Grades			<0.001
4th grade	78 (44)	98 (56)	
5th grade	66 (31)	144 (69)	
6th grade	165 (59)	116 (41)	
Others have listened to me			<0.001
No	190 (54)	163 (46)	
Yes	113 (37)	194 (63)	
Teachers have listened to me			<0.001
No	171 (56)	134 (44)	
Yes	132 (37)	223 (63)	
I feel I have participated			<0.001
No	250 (50)	247 (50)	
Yes	53 (33)	110 (67)	
I have expressed my opinion			<0.001
No	202 (54)	172 (46)	
Yes	101 (35)	184 (65)	
I took responsibility			0.033
No	167 (50)	167 (50)	
Yes	136 (42)	190 (58)	
I have listened to others			0.005
No	85 (56)	67 (44)	
Yes	218 (43)	290 (57)	
I have been involved in planning			<0.001
No	161 (56)	127 (44)	
Yes	142 (38)	230 (62)	
I have learnt more about health			<0.001
Disagree	75 (69)	34 (31)	
Agree	231 (42)	322 (58)	
I am more aware of how I learn			<0.001
Disagree	110 (70)	48 (30)	
Agree	197 (39)	309 (61)	

(Continues)



TABLE 1 (Continued)

Variable	Low health experience, n (%)	High health experience, n (%)	p-Value*
I have the opportunity to influence activities			<0.001
Disagree	99 (66)	51 (34)	
Agree	205 (41)	300 (59)	
I am satisfied with my school performance			<0.001
Disagree	83 (87)	12 (13)	
Agree	225 (40)	343 (60)	

The total *n* of 667 includes all participants at all measurement occasions from baseline to follow-up.  
\**p*-value for Pearson chi-square.

pupils with low health experience, there was a decrease in the number reporting learning more about health ( $p = 0.010$ ) and satisfaction with their school performance ( $p = 0.039$ ; Table 3).

DISCUSSION

Below, the study results are discussed not only in relation to the implementation of the present study but also with a focus on implications for future similar school health promotion projects. The results showed that pupils’ participation in this health promotion project had an effect on their experience of health, learning and influence. Even though not all results in this study were significant, the findings revealed associations between pupils’ health experience, pupil influence and metacognition about health and learning. Furthermore, knowledge of both positive and less positive project experiences and results may be of value for future health promotion projects in a larger population or context (Langford et al., 2015).

The pupils’ health experience did not increase significantly from baseline to follow-up ( $p = 0.672$ ) or when health experience was dichotomised into low or high health experience ( $p = 0.144$ ). One reason could be that changes in health experience may need a longer time frame before they become measurably visible. However, variables concerned with learning and pupil influence did show significant positive results after the implementation of this health promotion project. Comparisons of health experience from baseline to follow-up between groups showed that the number of pupils with high health experience who felt that others listened to them ( $p = 0.021$ ) and who felt that they could express their opinions ( $p = 0.011$ ) increased during the project. This suggests that pupils with high health experience feel confirmed in their school situation if they are listened to and are given the possibility to express their opinion, and consequently, they participate actively in the project process. The implication of this is that active participation can lead to an even better health experience and a positive health spiral. One of the most powerful predictors for future good health is current good health status (Bauer et al., 2006). Variables concerned with pupil influence, participation and confirmation are factors that, in the long term, can contribute to a positive health experience and increased learning (Kelly et al., 2020; Warne et al., 2013). Health promotion through pupil influence, participation and confirmation can in this way function as the inextricable and valuable link between health and education and should therefore be highlighted (Bonell et al., 2013).



**TABLE 2** Logistic regression analysis, with health experience as dependent variable ( $n = 667$ )

Variable	Wald	Sig.	Exp(B)	95% CI for EXP(B)	
				Lower	Upper
Health experience, baseline <sup>a</sup> – follow-up	1.449	0.229	1.633	0.735	3.628
Gender (Girls <sup>a</sup> )	0.238	0.626	0.804	0.334	1.935
Grade 6 <sup>a</sup>	0.129	0.937			
Grade 4	0.127	0.722	0.844	0.333	2.143
Grade 5	0.033	0.856	0.911	0.333	2.493
Other pupils have listened to me (Yes <sup>a</sup> )	0.351	0.554	0.757	0.300	1.905
Teachers have listened to me (Yes <sup>a</sup> )	0.006	0.940	0.961	0.345	2.680
I feel I participated (Yes <sup>a</sup> )	0.019	0.889	1.078	0.374	3.111
I have expressed my opinion (Yes <sup>a</sup> )	4.905	<b>0.027</b>	0.323	0.119	0.878
I took responsibility (Yes <sup>a</sup> )	0.197	0.657	1.229	0.495	3.047
I have listened to others (Yes <sup>a</sup> )	0.652	0.419	0.645	0.223	1.869
I have been involved in planning (Yes <sup>a</sup> )	0.161	0.689	0.818	0.306	2.189
I have learnt more about health (Agree <sup>a</sup> )	0.025	0.874	0.867	0.148	5.083
I am more aware of how I learn (Agree <sup>a</sup> )	1.459	0.227	0.456	0.128	1.630
I have the opportunity to influence activities (Agree <sup>a</sup> )	0.001	0.980	1.015	0.320	3.216
I am satisfied with my school performance (Agree <sup>a</sup> )	6.895	<b>0.009</b>	0.045	0.004	0.455

Variables included in the equation are: (1) independent variables (IVs) baseline versus follow-up, gender, grade, as well as: Other pupils have listened to me, Teachers have listened to me, I feel I participated, I have expressed my opinion, I took responsibility, I have listened to others, I have been involved in planning, Activities have made me learn more about health, Activities have made me more aware of how I learn, I have the opportunity to influence activities, I am satisfied with my school performance this week and (2) the DV of the experienced health.

Omnibus Tests of Model Coefficients: chi-square = 38.719,  $p < 0.001$ ; Cox & Snell  $R$  Square = 0.232; Nagelkerke  $R$  Square = 0.309; Hosmer and Lemeshow Test chi-square = 4.902,  $p = 0.768$ .

$n = 667$ , includes all measurement occasions from baseline to follow-up.

Abbreviation: CI, confidence interval.

<sup>a</sup>Reference category.

The results showed that the mean values for health experience were different between boys and girls ( $p = 0.040$ ), with the girls reporting poorer health compared to the boys. When dichotomising health experience into low and high, and examining health experience by gender, the difference was not significant ( $p = 0.456$ ). However, the results suggest some change in health experience, as there were fewer boys with low health experience, and more girls with high health experience, at the follow-up compared to baseline. Research often reveals a significant difference in health experience between genders (Hagquist, 2009; Inchley et al., 2016), with girls more often showing poorer health (Bor et al., 2014; Inchley et al., 2016). This study found a similar result for overall health experience, but not when health experience was dichotomised into low and high. However, the gender comparison showed that there were more respondents among both girls and boys who at follow-up had a high health experience, which indicates that this type of health promotion project can have a health promoting effect among both boys and girls.

**TABLE 3** Group comparison\* of rating health experience at baseline ( $n = 85$ ) and follow-up ( $n = 73$ )

Variable	Low health experience		High health experience	
	Baseline $n = 37$	Follow-up $n = 41$	Baseline $n = 44$	Follow-up $n = 28$
Gender				
Boy	28 (64)	16 (36)	26 (54)	22 (46)
Girl	18 (55)	15 (45)	12 (38)	20 (62)
$p$ -Value*	0.421	0.191		
Grades				
4th grade	11 (58)	8 (42)	8 (35)	15 (65)
5th grade	13 (54)	11 (46)	15 (52)	14 (48)
6th grade	22 (65)	12 (35)	16 (55)	13 (45)
$p$ -Value*	0.710	0.306		
Others listen to me				
No	31 (63)	18 (37)	22 (63)	13 (37)
Yes	13 (50)	13 (50)	17 (37)	29 (63)
$p$ -Value*	0.267	0.021		
Teachers listen to me				
No	25 (57)	19 (43)	17 (55)	14 (45)
Yes	19 (61)	12 (39)	22 (44)	28 (56)
$p$ -Value*	0.699	0.343		
Felt participation				
No	35 (57)	26 (43)	27 (50)	27 (50)
Yes	9 (64)	5 (36)	12 (46)	14 (54)
$p$ -Value*	0.636	0.637		
Express my opinion				
No	32 (60)	21 (40)	23 (64)	13 (36)
Yes	12 (55)	10 (45)	16 (36)	29 (64)
$p$ -Value*	0.641	0.011		
Take own responsibility				
No	27 (63)	16 (37)	22 (56)	17 (44)
Yes	17 (53)	15 (47)	17 (41)	25 (59)
$p$ -Value*	0.440	0.152		
I listen to others				
No	13 (57)	10 (43)	5 (42)	7 (58)
Yes	31 (60)	21 (40)	34 (49)	35 (51)
$p$ -Value*	0.802	0.626		
Felt involved in planning				
No	25 (64)	14 (36)	12 (43)	16 (57)
Yes	19 (53)	17 (47)	27 (51)	26 (49)

(Continues)

TABLE 3 (Continued)

Variable	Low health experience		High health experience	
	Baseline <i>n</i> = 37	Follow-up <i>n</i> = 41	Baseline <i>n</i> = 44	Follow-up <i>n</i> = 28
<i>p</i> -Value*	0.320	0.488		
Learn more about health				
Disagree	5 (31)	11 (69)	2 (40)	3 (60)
Agree	40 (67)	20 (33)	36 (48)	39 (52)
<i>p</i> -Value*	0.010	0.729		
How I learn				
Disagree	17 (57)	13 (43)	5 (46)	6 (54)
Agree	28 (61)	18 (39)	34 (49)	36 (51)
<i>p</i> -Value*	0.716	0.847		
Influence activities				
Disagree	10 (46)	12 (54)	6 (60)	4 (40)
Agree	36 (68)	17 (32)	31 (46)	37 (54)
<i>p</i> -Value	0.069	0.394		
Satisfied with school performance				
Disagree	7 (39)	11 (61)	0 (0)	1 (100)
Agree	39 (66)	20 (34)	39 (49)	40 (51)
<i>p</i> -Value*	0.039	0.329		

More than 20% of the cells have cell counts <5.

Italics indicate *p*-values.

\*Pearson  $\chi^2$ .

Regarding health experience, there was a significant difference ( $p = 0.000$ ) between the different grades (4th–6th) and also between the grades and various variables relating to experience of pupil influence, and metacognition about health and learning, which were all statistically significant, at  $p < 0.001$ . The difference was that pupils in grade 4 reported higher health experience than those in grade 6. A possible explanation for this may be pubertal development in this age group (Inchley et al., 2016; Viner et al., 2017). This age-related difference suggests that separate types of targeted interventions may be required, and future studies should investigate the importance of age in the implementation of projects. To increase health and learning, it is clearly important when designing future projects to bear the age group in mind and ensure that activities and content are developmentally appropriate for the specific age group (Inchley et al., 2016; Viner et al., 2017). Investment in pupils' health during younger years is clearly valuable for creating healthy and productive adults and for preventing health-related suffering (Bonell et al., 2013). Also, when designing future projects for older pupils (e.g., 6th grade), the results imply that it is necessary to work in a different way than with younger pupils and focus activities on more targeted content to meet the age group in the best way, based on where they are developmentally, and thus to increase health and learning (Bonell et al., 2013; Inchley et al., 2016; Viner et al., 2017).

Various variables regarding experience of pupil influence, and metacognition about health and learning, were combined in a logistic regression model to see which variables contributed most to health. The results of the logistic regression showed that the pupils' satisfaction with school performance

( $p = 0.009$ ), which also had the highest Wald value (6.895), contributed most to health experience. Therefore, the pupils should be given explicit opportunities to develop their self-assessment skills, reflect about their school performance and should be able to exert influence continuously upon their own learning process. According to Einarsdóttir (2007), are pupils capable of describing their own perspectives on learning and achievement even at a young age, indicating that implementation of self-assessment can be done at an earlier age than middle school. This will increase metacognition about what they have learned, how they learn best and how they become most motivated and engaged in learning. A related significant association in the regression model was between health experience and pupils expressing their opinion ( $p = 0.027$ ). The pupils' opportunity to express their opinion about and influence the project every week seems to have had positive health effects. An implication to highlight is that projects with a health-promoting focus have the potential to create health effects while it is running if pupils are able to contribute their opinion to the project's design throughout the process. Doek (2014) also emphasise pupils' right to express their own experiences, views and perspectives as active participants during a project.

Results concerning pupil influence from the regression analysis showed that the respondents' health was influenced to some extent if they felt involved, were taking responsibility and were able to influence the project activities since the OR slightly increased (1.078, 1.229 and 1.015, respectively) when compared to health experience. Also, the follow-up compared to the baseline measure of health experience had the highest OR (1.633; 95% CI 0.735–3.628), revealing that, despite the short time span of 11 weeks of actual work with the intervention, a positive long-term health effect from having participated in the project was possible. An implication for future similar school health promotion projects is the need for a slightly longer project period to be able to achieve greater health effects, since previous research has also found that factors such as the duration, frequency and intensity of interventions influence the effectiveness of interventions (Dobbins et al., 2013; Lai et al., 2014). These findings confirm that health promotion in schools is beneficial for strengthening pupils' resources for health, having an influence and learning and achieving in school. This is important as these benefits in turn create conditions for a productive and healthy life as an adult (Jackson, 2015; Langford et al., 2015).

Our results also show that health promotion projects with a clear approach based on principles for action research, where the pupils' influence is continuously promoted, can have an impact on school children's health experience and learning. Health promotion based on action research principles has previously been shown to have beneficial effects on learning because the participants are involved and make reflections during the process (Ainscow et al., 2004). These beneficial effects are concerned with both how pupils themselves experience learning, influence and participation and how the individual pupil relates to his or her peers. However, the negative result regarding satisfaction with school performance for pupils with low health experience ( $p = 0.039$ ) indicates the need to focus more on this group and work with them strategically and systematically due to the strong link to health experience. Since satisfaction with school performance was identified as the most important determinant of health experience ( $p = 0.009$ ), this warrants addressing to avoid a detrimental health effect over time. Encouraging pupils and giving them time for reflection on their own health and learning, and about what they are doing and why, can make activities more goal-oriented and individual in the project process. This often increases motivation for learning and contributes to developing capacity for metacognition about health and learning (Sandberg et al., 2017). Also related to this were the results indicating that pupils with a low health experience during the project seemed to remain at risk for a low health experience (see Table 3). An explanation could be that their experience of low health was preserved by an increased health awareness when participating in the project, with an adherent risk for a continuous low experience of health in the future. Pupils with low health experience are thus in

need of special consideration and project adaptation but without singling them out, to create the best possible prerequisites for increased health and learning in this group. A previous study highlighted that regardless of which health group the participants are allocated to, health promotion activities are suitable as they can confirm and include the participants in their own process (Nilsson Lindström & Bringsén, 2021). A concluding observation from the findings is that an action-oriented model for health promotion activities in school seems to affect pupils' experience of health and learning in different ways. Focusing on pupil influence during the process fostered prerequisites to meet pupils with both high and low health experience and formed activities that met both individual and collective health and learning needs.

## Strengths and limitations

Strengths and limitations in relation to *validity* and *reliability* must be considered after completion of a study. Self-report measurements, with the known limitation of recall bias, were used in the study. However, the repeated measure strategy, with eight administrations of the questionnaire, combined with the teachers' repeated discussion of the project activities before distributing the questionnaire, was considered a way of limiting the risk of recall bias. The limitation regarding that the same group of pupils (grades 4–6) answered the survey weekly was highlighted earlier.

The *reliability* of the study can be considered both a limitation and a strength. The context-specific small-scale health promotion project can be challenging regarding replication in other contexts. On the other hand, the context-specific small-scale health promotion project makes it possible to describe in detail, thus strengthening the reliability of the study and transferability of the results. The study and the study context have therefore been described in detail in the method section.

During the study, the results were member-checked (Stringer & Genat, 2004) by the participants, which confirmed the accuracy of the findings, and strengthened both the *internal validity* and *objectivity* of the results. A limitation related to *external validity* was that non-significant results were also presented. However, the results have highlighted the aspects of health, learning and pupil influence that are important to test in larger populations. Also, it was deemed to be of public interest to establish the possible impact on pupils' health and learning of participating in a small-scale health promotion project within a short project time frame. The *external validity* was also ensured by discussing practical implications of the result for further health promotion in schools.

## CONCLUSION

This quantitative study in a middle school in Sweden showed significant differences in health experiences related to gender and grade, with girls and older pupils (6th grade) reporting low health experience to a greater extent than the younger pupils. The youngest pupils (4th grade) reported experiencing pupil influence and metacognition about health and learning more often compared to their older peers. The findings therefore suggest that considerations and adaptations of activities and processes need to be made regarding pupils' gender and age in future school health promotion initiatives. An adaptation to meet both individual as well as collective needs with adherent prerequisites for pupils' learning, school performance and health experience is also needed.

The factor that was shown to contribute the most to health experience among the pupils was satisfaction with school performance, indicating that activities for students' self-reflection, awareness and empowerment concerning school performance can be used for promotion of health in school settings.


Other health-related factors that were found to show improvements during the health promotion project were centred on pupil influence and learning about health during the project, for example, that pupils could express their opinions and that others listened to them. Active participation and pupil influence are therefore important resources for successful school health promotion initiatives and can be realised through an action-oriented model for health promotion. However, the results from baseline to follow-up did not demonstrate significant health effects, which might have to do with the short timeframe of the project. Time is thus another issue that needs to be considered in future actions for health promotion in schools.

More research conducted over a longer period of time is needed concerning health promotion in order to be able to draw conclusions about significant health effects. With a longer time frame, fluctuations in pupils' health experience may be identifiable on both individual and group levels. The implication for activity adaptation related to age and gender is also something to consider in future action or intervention research focusing on school health promotion in order to further explore the complex relationships among pupils' health, learning and influence.

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