

# **How effective is the health promoting school approach in building social capital in primary schools?**

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## **Abstract**

**Purpose** - The purpose of this paper is to describe a study which investigated the relationship between the ‘health promoting school’ (HPS) approach and social capital; and tested the proposition that the implementation of a HPS intervention leads to a significant improvement in HPS features and social capital.

**Design/methodology/approach** - A prospective intervention study design was used and involved the comparison of an intervention population group and a comparison population group matched for school size, urban location, school type and socio-

economic status. The intervention group used the holistic HPS approach to promote resilience, whereas the comparison group did not use the HPS approach. In the intervention schools, 262 staff in the pre-intervention phase, and 288 staff in the post-intervention phase responded to the survey. In the control schools, 156 staff in the pre-intervention phase, and 261 in the post-intervention phase responded. The HPS Scale derived from the Ottawa Charter and the Social Capital Scale derived from the Social Capital Index were used at the school community level.

**Findings** - There was a statistically significant relationship between HPS indicators and social capital. Our evidence indicates that a HPS approach to build social capital is effective.

**Practical implications** - The results indicate that social capital embedded in the HPS structure has the capacity to substantially affect relationships that people have with each other and school psychosocial environment.

**Originality/value** - This paper provides health educators with resource strategies to promote social capital within the HPS program framework.

**Keywords:** health promoting school, social capital, school environment

**Paper type:** Research paper

## **INTRODUCTION**

Since the last decade, the role of social capital in school health has been an area of research interest. A selection of studies have considered the link of social capital to child wellbeing (Woolcock, 2001), child mental and physical health (Caught *et al.*, 2003) and the ability of children to resist social stress (Resnick, 1997). School social

capital is a fundamental factor in the positive health outcome in the school environment (Sampson *et al.*, 1999) and academic achievement (Coleman, 1988). It has been found that key social capital components, such as supportive school climates (caring and supportive relationships) and school bonding (trust and sense of school community), when combined, can facilitate a broad range of children's positive outcomes. Social capital components are considered to function as protective factors in the individual, or in the environment, enhancing an individual's ability to resist adverse outcomes, such as adolescent pregnancy, delinquency, drug use, academic failure and child maltreatment (Coleman and Hoffer, 1987; Furstenberg and Hughes, 1995; Putnam, 2000; Teachman *et al.*, 1996). The individual's health outcomes depend on whether he or she resides in a school environment that is rich or poor in social capital (Portes, 1998).

Social capital embedded in social structure has been characterised as a resource that resides in the relationships that people have with each other, and that individuals within a social structure can draw upon to achieve certain actions (Kawachi and Berkman, 2000; Veenstra, 2005). It has been described as “features of social organisation, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit” (Putnam, 1993, p. 35), enabling people to act collectively (Woolcock, 2001 ). For children, schools are characterised as social organisations that are uniquely suited to the wide range of interventions needed to promote positive health outcome through enhancing social capital (World Bank Group, 2007). The building blocks of social capital in most models include: trust, engagement and connection, collaborative action, shared identity, shared values and aspirations (Onyx and Bullen, 2000).

## **Social capital and health promoting school**

The role of the school in promoting health in children is recognised worldwide through the ‘health promoting school’ (HPS) approach (Anderson, 2004; Lynagh *et al.*, 2002; Stewart *et al.*, 2004). This approach was developed over more than a decade ago using the World Health Organization (WHO) Global School Health Initiative (WHO, 1986). Evaluations of the HPS model consistently demonstrate its effectiveness in providing positive outcomes for children’s health (Roeser *et al.*, 2000; Rogers *et al.*, 1998; Schaps and Soloman, 1990; Scriven and Stiddard, 2003; St Leger and Nutbeam, 1999; Stewart *et al.*, 2004). Implicit in HPS approach is the idea that the school community’s health can be fostered and promoted by establishing health promotion actions at an organisational level. As a model, the HPS encompasses change in three broad areas: 1) formal curriculum in health education with a specific time allocation for topics, 2) subjects and cross curricular themes that emphasise connectedness and caring relationships between school members, and between home and school; 3) recognition of the important role that the school has to promote health in the community in which it exists, and development of appropriate links with the wider community to support this role. A key strategy that facilitates collaborative school-community relations, caring relationships between school staff, student-teacher and student-parents, is one that is characterised by the key elements of social capital such as trust, effective communication, and a collective action towards problem solving. However, few studies in published literature have examined the relationship between HPS and social capital, and the involvement of health promotion embedded in HPS model in building social capital at the primary school community settings.

The hypotheses laid out below will test the proposition that HPS may be a key variable influencing the social capital. By focusing on and improving school organization using HPS approach, schools may begin making a contribution to developing the entire school community's capacity to build social capital.

This study focuses on the relationship between factors associated with the HPS approach and social capital at the primary school level. HPS factors include such features (WHO, 1995) as:

- the school is concerned with health promotion relating to the physical environment, social environment, and overall 'climate' having regard to the relations between staff and family, and staff and students
- the school health services are accessible to all school members
- the school provides personal skills building, and
- the school promotes school and community partnerships

This study aims to investigate the relationship between the HPS and social capital. It explores two general hypotheses: 1) there is a significant association between HPS and social capital and 2) that the implementation of a HPS intervention leads to a significant improvement in HPS features and social capital.

## **METHODS**

### **Research design**

The study used a prospective intervention design involving the comparison of an intervention population group (10 urban primary schools in a region north of Brisbane, Australia) to a control population group (10 urban primary schools in a region south of Brisbane) matched for school size, urban location, type (State or Catholic) and socio-economic status. The intervention group used the holistic HPS approach to promote social capital, and the comparison group did not use the HPS approach designed for the current study. A comparison has been made between intervention and control schools over the two and a half year time period of the project.

## **Participants**

This paper is concerned with the all school staff (e.g. teaching and non-teaching) in the 20 schools. The data were collected at two levels: school staff sampled at level 1 clustered within schools at level 2.

Data collection was carried out in November and December in 2003 in the pre-intervention phase, and October 2006 for the post-intervention phase. Data collection for the staff sample was carried out by two project officers through the distribution of a questionnaire at staff meetings organised by the school principals.

Specific written instructions were issued to staff describing the administrative procedures to be followed. Participants were clearly informed about the study and asked to provide their consent to participate. Participation was voluntary and a guarantee of anonymity was given. Ethics approval was obtained in October, 2003, from the Queensland University of Technology's Human Research Ethics Committee, Education Queensland Ethics Committee, and Catholic Education Ethics Committee (ethics approval number: QUT Ref No 3058H).

The school characteristics are shown in Table 1 below.

***Insert Table 1***

Five of the intervention schools and 5 control schools were small in size. Three intervention schools were of medium size and these were matched with three control schools of medium size, and two large intervention schools were matched with two large control schools. Eight State Schools were matched with 8 control State Schools, and two Catholic Schools were matched with two Catholic Schools.

Characteristics of school staff are shown in Table 2.

***Insert Table 2***

Staff in the intervention schools, 262 staff (response rate of 49.5 %) responded to the survey in the pre-intervention phase, and 288 staff (response rate of 59.5 %) responded in the post-intervention phase. In the control schools, 156 staff (response rate of 36.2 %) responded in the pre-intervention phase, and 261 responded (response rate of 58.4 %) in the post-intervention phase.

Most staff were female (86 %) and 68 % were classroom teachers. Most staff had working experience of three years or more. This proportion was similar to both intervention and control schools at both pre- and post-intervention phase. Chi-square tests showed that there was no significant ( $P > .05$ ) differences between intervention and control schools in the proportion of staff with respect of staff role, gender and years of working experience.

### **Intervention strategies and activities**

The intervention was implemented in 10 intervention schools from August 2004 to August 2006. The intervention schools were required to use a HPS approach (WHO, 1995) to develop intervention activities. Such an approach focuses on the organisational change processes within a school. Strategies that promote a healthy school climate, or environment, were identified as those encouraging personal skill building in students, staff and parents; fostering positive relationships within school and family social networks; and endorsing supportive environments within the school. The intervention activities were developed around the issues identified by each school community: resilience, anti-bullying, healthy physical and social environment building, professional development in staff and parents in HPS principles, communication skills, health behaviours, extra curriculum development in music, drama, sport and peer relationship.

The intervention strategies using health promoting school principles in 10 intervention schools emphasised the following themes, summarised in the Table 3 below.

### ***Insert Table 3***

### **Measures**

A number of scales were adopted, modified or developed. They included:

(a) *Health Promoting School (HPS) Scale*: the structure of the HPS scale was based on factors identified in the Ottawa Charter (WHO, 1986) and items for the Staff Survey were based on a review of the literature in relation to the key features of the HPS that best described these factors (Deschesnes *et al.*, 2003; Loureiro, 2004; Lynagh *et al.*, 2002; Rogers *et al.*, 1998; Scriven and Stiddard, 2003). This scale was initially developed and tested in a study by Lemerle (2005) involving 797 teachers in

39 schools in Queensland, Australia. Reliability of this scale is high, with alpha levels of 0.80 for the whole scale and levels ranging from 0.77 to 0.82 for the six subscales. The total variance explained by this scale is 60 %, indicating reasonable level of validity.

There are a total 32 items for the HPS scale. Items of the HPS scale, designed to assess aspects of the school that helped to promote health included: health policy, physical environment, social environment, school-community relations, personal skill building, and health services provision. For example, a question from the HPS scale included: “To what extent is your school actively putting into place the following policies ...?”, was followed by a series of options such as, “ ...preventing the use of alcohol, tobacco and illicit drugs” and “ ...accident and injury risk reduction.” A 5-point Likert scale format was kept as in the original Lemerle HPS scale, wherein 1 indicated “not at all” and 5 indicated “a great deal”.

(b) *Social Capital Scale*: The most common existing instrument to measure social capital in the general community context consists of the Social Capital Index, which was developed and empirically tested by Onyx and Bullen (2000). This instrument encompasses the following factors which are related to social capital in the school community: 1) participation in the local community (participation in formal community structure), 2) proactivity in a social context (sense of personal and collective efficacy), 3) feelings of trust and safety (feelings that most people in the community can be trusted), 4) tolerance of diversity (views of multiculturalism in community) and 5) work connections (feelings of team at work). There were 36 items in original scale. Twenty items pertinent to social capital in school were selected (See Appendix 1).

The subscales for the social capital included: feelings of trust and safety, pro-activity in a social context, tolerance of diversity and work connection. Questions selected included items such as: “Do you feel valued by this school?” and “Is this school regarded as a safe place?”. The format of the social capital was changed from the Onyx and Bullen (2000) original 4-point Likert scale to a 5-point Likert scale in which 1 indicated “never” and 5 indicated “always”. The reliability and validity had been checked for the scale. Reliability of this scale was high, with alpha levels of 0.87 for the whole scale and levels ranging from 0.61 to 0.79 for the four subscales. The total variance explained by the scale is 58 %, indicating a reasonable level of validity.

The underlying assumption for both the HPS measure and the social capital measure was that at the school, as a setting in which not only children but also many adults spend a very substantial part of their day, is the best place to promote all school members’ health and well-being. Factors that may contribute to resilience at the school community level are contextual and include factors such as school ethos, social environment and physical environment. Furthermore, opportunities for all school members to access health services and resources, opportunities for personal development and co-curricular participation contributed to HSP environment. The development of an atmosphere of mutual support and trust, with high collective expectations of success in meeting challenges, combined with the capacity to cope with a crisis, were qualities considered to strengthen the school community.

### **Data analysis**

The association between HPS and social capital was analysed by multilevel analysis controlled for confounding factors at the individual level. Controlled factors included gender, years of working experience, and position of staff, and type and size of school.

The intervention effect on HPS and social capital was examined by using the multilevel approach. This analysis considered the interaction of time (time 1 and time 2) and group (intervention and control groups), while the potentially confounding factors at an individual level (e.g. staff role in the school, years of work experience, and gender) and at the school level (e.g. school size and school type) were adjusted in the model.

The multilevel models took into account the 2-level hierarchical structure of the data for staff (level 1), sampled within schools (level 2). Multilevel modelling was preferred for staff sampled within schools because it was likely that there was some standardisation in workplace environmental factors. Thus, the clustering effect of staff within schools, which may generate improper estimates of standard errors, was adjusted.

A 2-level hierarchical linear regression model was employed using MIWiN version 2.1:

$$Y = \beta_0 + \beta_{1j}group + \beta_{2j} + v_i + u_j$$

Where  $Y$  is the outcome variable for the  $i$ th staff and in the  $j$ th school. The  $\beta$  represents parameter to be estimated,  $v$  and  $u$  denote random effects that are assumed to be independently normally distributed with means equal to 1 and variances  $\sigma_v^2$  and  $\sigma_u^2$  respectively.

## RESULTS

The demographic variables for staff (role in the school and years of working experience) were found to have significant relationships with both HPS and social capital scales. Table 4 presents the relationship between staff demographic characteristics and health promoting school and Table 5 presents the relationship between staff demographic characteristics and social capital for this study.

### *Insert Table 4*

Table 4 indicates that teaching staff tended to score lower on HPS characteristics than did principals, administrative staff, and other non-teaching staff. These differences reached statistical significance (Parameter = 0.08,  $P < 0.05$ ) in terms of the physical environment. Staff with less than 1-2 years working experience had lower scores on the overall health promoting school, than did staff who had more than 2 years of working experience. These differences reached statistical significance in the health promoting school factors relating to school-community relations (Parameter = -0.04,  $P < 0.01$ ). Large schools tended to have lower scores on the overall HPS than did medium size and small schools. These differences reached statistical significance in the health promoting school factors relating to physical environment (Parameter = -0.13,  $P < .001$ ). State schools tended to have lower scores on the overall HPS than did Catholic schools. These differences reached statistical significance in the HPS factors of physical environment (Parameter = 0.51,  $P < 0.001$ ), personal skills building (parameter = 0.32,  $P < 0.001$ ), and access to health services (Parameter = 0.34,  $P < 0.001$ ).

***Insert Table 5***

It is evident (Table 5) that there is no significant difference between the teaching and non-teaching staff in social capital indicators. School size, school type, staff working experience, however, had a significant relationship with social capital. For instance, staff with less than 1-2 years working experience had lower scores on the overall social capital indicators, than did staff who had more than 2 years of working experience. These differences reached statistical significance in factors relating to 'proactivity in a social context' (Parameter = 0.04,  $p < 0.05$ ) and 'work connections' (parameter = 0.07,  $p < 0.05$ ). Large schools tended to have lower scores on the overall social capital indicators, than did medium size and small schools. These differences reached statistical significance in the social capital factors of trust and safety (Parameter = -0.16,  $P < 0.01$ ), and proactivity in a social context (Pamameter = -0.06,  $P < 0.01$ ). State schools tended to have lower scores on the overall social capital indicators than did Catholic schools. These differences reached statistical significance in feelings of trust and safety (Parameter = 0.39,  $P < 0.01$ ), proactivity in a social context (Parameter = 0.16,  $P < 0.01$ ) and work connection (Parameter = 0.23,  $P < 0.01$ ).

Table 6 below shows the relationship between the HPS approach and social capital.

***Insert Table 6***

Significant relationships were found between HPS and staff perceptions of social capital. This indicates that HPS is significantly related to social capital factors of trust among staff , staff proactivity in school life, and staff working relationship.

Tables 7 and 8 below show the intervention effect on the HPS approach and social capital indicators.

*Insert Table 7*

*Insert Table 8*

For the intervention schools, all of the HPS and social capital indicators improved at the post-intervention phase. These improvements reached statistical significance in three out of six HPS indicators, and three out of four social capital indicators. The three HPS indicators include: 1) social environment (Parameter = 0.23,  $P < 0.01$ ), 2) improved school-community relations (Parameter = 0.33,  $P < 0.001$ ), and 3) increased access to personal skill building activities (Parameter = 0.25,  $P < 0.001$ ). Statistically significant improvements occurred in social capital indicators of trust and safety (Parameter = 0.39,  $P < 0.01$ ), social proactivity (Parameter = 0.13,  $P < 0.01$ ), and work connection (Parameter = 0.20,  $P < 0.01$ ). These differences reached a statistically significance level regardless of staff individual characteristics (e.g. role, duration of teaching experiences and gender), school characteristics (State versus Catholic Schools) and school size were adjusted in the analyses.

Tables 7 and 8 indicated that there were statistically significant differences between schools in all of the HPS and social capital indicators. This suggested that there were statistically significant differences in staff perception of these indicators between schools, in terms of improvements at post-intervention measurement time. These differences were explained by school level variables such as school type and school size. State schools had lower scores than Catholic schools in all HPS and social capital indicators and large schools had lower scores than medium and small schools

in HPS and social capital indicators. The differences between schools may also be due to the variety of intervention approaches applied in the schools.

Tables 7 and 8 also show that there are significant differences between staff in all of the HPS and social capital indicators. These differences are largely explained by individual staff demographic characteristics such as staff roles in the schools, and years of working experience. Generally, staff with less than 1 year of working experience had lower scores than staff who had more years of work experience, and staff who had teaching roles had lower scores than staff who were principals, administrative and support staff.

## **DISCUSSION**

This HPS project involved a strong multidisciplinary and collaborative partnership between health and education organisations, a constant communication between staff, parents and students within intervention schools, and participation and engagement of staff, students and parents. Such approaches have the potential to maximise health promotion activities and outcomes at the community level, and have been strongly endorsed by a wide range of peak health bodies (NHMRC Health Advancement Standing Committee, 1996; WHO, 1995)

The purpose of this paper was to examine the relationship between HPS and social capital; and that the implementation of a HPS intervention leads to a significant improvement in HPS features and social capital. We found HPS is significantly related to overall social capital scores, with specific regard to staff's feelings of trust and safety, tolerance of diversity, and work relationship with other staff members. The relationship between HPS and social capital was found from this study using

population based approach indicating that HPS has capacity to substantially affect the relationship that people have with each other with respect to staff's sense of trust and safety and work connection with other school members. HPS also significantly affected the collective action that staff had as measured by proactivity in school context. According to Colquhoun (2000), this may be due to HPS and social capital, as both involve,

demographic ideals and processes; voluntary participation; notions or visions of the common good; collective involvement or action to achieve this ideal; 'prerequisite' skills and knowledge; and potential for use in both environmental and health education within schools as organisations; realistic understandings of social processes and contexts; perhaps a raised ecological awareness; community involvement in decision making (p. 9).

The empirical evidence derived from this study suggests that there is link between HPS action and social capital in the school context.

Staff role, staff working experience, school type and school size might be confounders of the intervention effect on intervention schools as the demographic factors were significantly associated with HPS and social capital. The study design for this study takes clustering effect into account for community based research, the intra-class correlation coefficient are significant for the multilevel analysis on intervention effect, suggesting cluster effect, and this was controlled in the analysis on intervention effect on both HPS and social capital. When these factors were adjusted in the data analysis, the implementation of HPS approach led to significant improvement in HPS features in intervention schools in the post-intervention phase. The intervention using the HPS framework at the school level may lead to changes in school organisational structure,

school policy, health service provision, curriculum, and school-community relationship as suggested in previous studies (Colquhoun *et al.*, 1997; St Leger and Nutbeam, 2000). The empowerment and democracy in the HPS model applied in this study may also contribute to the staff's commitment and participation that lead to significant changes in school environment (Scriven and Stiddard, 2003)

The involvement of the whole school community indicated that using democratic processes of HPS approach led to significant improvement in social capital with respect to staff's perception of trust and safety, proactivity in health promotion activities and work connections with other school members. According to Putnam (1993), social capital at the ecological level encompasses groups such as neighbourhood, communities, census tracts and others. For the purpose of this study, social capital links to the school community. The HPS actions at school level may have influenced: 1) health related behaviours by promoting diffusion of health-related information with increased likelihood that healthy norms of behaviour are adopted and 2) the extent that people volunteer, involve themselves in school activities, and are willing to help out the school communities. Our evidence indicates that HPS approach in building social capital in primary school is effective.

## **Conclusion**

The multi-strategy and multidimensional approaches inherent in the HPS model have allowed the targeting of multiple risk and protective factors across multiple contexts in the school community. The programs to address various health needs have allowed all school members to develop commitment to HPS related activities. The HPS model is ideally placed to support ongoing initiatives in a successful and sustainable

framework. It is dynamic allowing for new circumstances to be addressed and it is also inclusive in providing opportunities for identifying and celebrating success (St Leger and Nutbeam, 2000). An intervention activity that targets the development of partnerships and social relationships among school members fosters the development of norms, proactivity and collective actions in the school community (Sampson *et al.*, 1999). As suggested by Rowling and Jeffreys (2000), intervention that focused on shared vision and constant communication among school members significantly promoted trusting relationships among staff.

Staff play the main role in creating a supportive school ethos and climate. Staff acceptance of the intervention is clearly a critical variable for the success of the intervention and where there were high levels of acceptance and involvement, positive changes took place. This could be seen across the HPS areas with significant improvements observed in the school social environment, school-community relations, and staff personal skill building activities. Although not statistically significant, there were improvements in the areas of school health policy, physical environment and access to health services. Improvements were also seen in the promotion of a caring and supportive environment. Teachers indicated that they considered that the intervention had been of benefit to their school and students and that it had been the means whereby increased school involvement was gained from students, parents and the general community.

A HPS approach, that links schools with relevant agencies and groups, embeds protective factors into the curriculum and encourages school members' participation, is effective in creating social capital within the school environment. There is strong evidence in this study to show that HPS approach is closely linked to the

improvement in social capital in a primary school context. This is evidenced by the large extent to which the intervention schools promoted a healthy environment. School environment indicators (such as school social environment, school-community relations and personal skill building), with immediate effects in intervention schools compared with schools that were not using a holistic approach. The improvement was also shown in overall social capital score, and indicators of sense of trust and safety, proactivity in school context, and working relationship between staff.

More broadly, there is good evidence to show that social capital is a strong protective factor for a wide variety of health issues (Wilkinson, 1996). Our intervention schools showed a significant improvement in terms of supportive psycho-social indicators. Such indicators include a sense of trust and safety in the school, a desire to take a proactive role as a participant in school development and the development of positive relationships between staff in the working environment. The improvements shown by these indicators demonstrate that the HPS approach used by the schools significantly enhanced social capital in the schools.

There is also good evidence indicating that interventions which augment the social capital available in a person's environment can help protect against the adverse effects of psychosocial stressors (Phongsavan *et al.*, 2006). The effect of the intervention activities in the current project indicates that schools are the ideal place to promote social capital for school community. Therefore it could be that with further sustained effort in implementing the program within schools, a higher level of behavioural change could result.

There are number of limitations that may have mitigated against a greater intervention effect; for instance the time frame of the pre-post evaluation (Mitchell *et al.*, 2000).

The time frame employed was considered moderate in terms of influencing school organisational change. Given the positive findings indicating change in school social environment, personal skill building and school-community relations, it may be possible that a later follow-up may reveal a longer term effect.

Despite time constraints for the study period, this work is important as it provides a baseline evaluation of the relationships between HPS and social capital in HPS program in Australian primary schools. In light of the current, and an on-going, debate over which outcomes should be used to evaluate HPS interventions (Carlsson, 2005; Clauss-Ehlers, 2003; Rowling and Jeffreys, 2000), this study provides additional and alternative directions. One of the focus of this study was to examine the extent to which school's improvement in HPS and social capital in post-intervention phase can be explained by the characteristics of staff in those schools, for example, staff gender, position and working experience, as compared with effects attributable to the schools. This study adds substantial value to the field with the focus on statistical issues using a large scale population based approach that differences between the sampling units (schools) as a substantive area of interest was examined. To distinguish the effects of individual staff characteristics and school itself on HPS and social capital the study design in this study allowed the effects of staff characteristics (staff gender, working experience, position) on HPS and social capital outcome to be separated from that of the school (school type and size). A longitudinal study design was also used to exclude the possibility that school differences are not attributable to characteristics staff have before working the school (prior intervention). It is envisioned that future studies will focus on changes to school context as the main outcome. Given the positive relationship of social capital with HPS, we recommend that social capital is promoted in schools to foster the wellbeing and health of children.

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Table 1

## School characteristics

Schools	Intervention schools	Control schools
Size		
Small (n)	5	5
Medium (n)	3	3
Large (n)	2	2
Type		
State (n)	8	8
Catholic (n)	2	2
SES		
High	3	3
Medium	2	2
Low	5	5

Table 2

## Staff characteristics

Demographic variables			Intervention schools		Control schools		Total	$\chi^2$	P
			Pre-	Post-	Pre-	Post-			
<b>Main role</b>	Principal	N (%)	15(5.8)	15(5.4)	10(5.2)	12(4.7)	52(5.3)	8.70	0.19
	Teachers	N (%)	168(65.4)	197(70.6)	119(61.3)	186(72.4)	670(67.9)		
	Admin	N (%)	74(28.8)	67(24.0)	65(33.5)	59(23.0)	265(26.9)		
	Total N		257	279	194	257	987		
<b>Staff gender</b>	Male	%	42(16.2)	41(14.7)	26(12.9)	29(11.2)	138(13.8)	2.90	0.39
	Female	%	217(83.8)	238(85.3)	175(87.1)	229(88.8)	859(86.2)		
	Total N		259	279	201	258	997		
<b>Years of work</b>	<1 year	N (%)	35(13.6)	44(15.8)	27(13.8)	41(16.0)	147(14.9)	10.03	0.59
	1-2 years	N (%)	28(10.9)	30(10.8)	26(13.3)	38(14.8)	122(12.3)		
	3-5 years	N (%)	78(30.4)	69(24.7)	62(31.6)	60(23.4)	269(27.2)		
	6-10 years	N (%)	64(24.9)	78(28.0)	45(23.0)	73(28.4)	260(26.3)		
	>10 years	N (%)	52(20.2)	58(20.8)	36(18.4)	45(17.5)	191(19.3)		
	Total N		257	279	196	257	989		

Table 3 Intervention strategies and actions

<b>Intervention strategies</b>	<b>Actions</b>
Constant communication and shared visions	<ul style="list-style-type: none"> <li>principals and project committees communicated regularly, sharing a common vision/mission of the school's health problems and ways in which they could be improved</li> <li>The committee members constantly sought feedback from agencies and organizations, that are partners with the school, on changes that are needed.</li> <li>student needs assessment were conducted to determine suitable health promotion activities.</li> <li>Principals and project committees informed school members of project progress at school staff meetings and school assembly.</li> </ul>
Develop staff's sense of ownership	<ul style="list-style-type: none"> <li>Empower staff: The intervention was implemented through two leadership teams for the project. One leadership team included school staff, the principal, parents and students. Additionally, there was a parent association, comprised of community members and parents, which was the supporting body of the school.</li> <li>Both teams worked together closely in developing school plans and monitoring the implementation of stated objectives/outcomes for the HPS project to provide staff with collegial interaction and opportunities to talk with parents.</li> <li>Teachers were provided with school based professional development opportunities to develop their expertise in HPS principles.</li> <li>Teachers were encouraged to participate in university training program with the aim of providing leadership training to implement school based HPS activities.</li> </ul>
Providing a	<ul style="list-style-type: none"> <li>Resources and structures were provided to support a health</li> </ul>

<p>structure that supports a culture of HPS</p>	<p>promotion culture. Project funding was provided to each intervention school, a project committee in each intervention school was established, and an action plan was developed to implement the HPS activities.</p> <ul style="list-style-type: none"> <li>• Health promoting school culture was developed through articulation of school policy, refocusing curriculum on health promotion, student skill's development in coping, problem solving, seeking help and support from family, school and community and parent workshop in HPS.</li> <li>• These schools adopted various health promotion curricula such as, "You can do it" and "Virtues", that were aligned with the HPS principles.</li> <li>• Project team from our university provided quarterly training workshop on HPS principles to school project team.</li> <li>• University project team provided guidance and monitoring activities to school HPS project on a weekly basis.</li> </ul>
<p>Support for School Partnerships</p>	<ul style="list-style-type: none"> <li>• The university project working team collaborated closely with school project committee to facilitate the implementation of the HPS program and has provided continuous support on a weekly basis.</li> <li>• Schools were associated with various organizations (local city council, local departments of Education and Health, museum, community agencies, and youth groups) that provided the school with a range of support services and resources on a periodic or weekly basis depending on school's circumstances.</li> <li>• More specifically, these partnerships focused their efforts in building partnerships between school and families and school and communities.</li> </ul> <p>These partnerships provided schools with resources to promote student peer relationship and healthy physical environment, social interaction opportunities, and professional development for staff and parents.</p>

Table 4 Staff characteristics and Health Promoting School indicators

Response variables		School size	School type	Main role	Years work	Variance explained		Variance explained	
						School level	%	Staff individual level	%
<b>Health policy</b>	Parameter	-0.05	0.19	-0.01	0.05	0.02	6.98	0.24	93.08
	SE	0.05	0.11	0.05	0.02	0.01		0.02	
	t-value	-1.06	1.64	-0.26	2.65**	2.00*		15.00***	
<b>Physical environment</b>	Parameter	-0.13	0.51	0.08	0.00	0.06	13.80	0.38	86.30
	SE	0.05	0.11	0.04	0.02	0.02		0.02	
	t-value	-2.66**	4.55***	2.05*	0.13	3.53***		20.89***	
<b>Social Environment</b>	Parameter	-0.04	0.18	-0.04	0.01	0.04	9.70	0.35	90.30
	SE	0.04	0.09	0.04	0.02	0.01		0.02	
	t-value	-0.98	1.86	-1.13	0.47	3.17***		20.76***	
<b>School-community Relations</b>	Parameter	-0.08	0.08	0.01	-0.04	0.04	8.70	0.42	91.30
	SE	0.04	0.10	0.04	0.02	0.01		0.02	
	t-value	-1.80	0.86	0.17	-2.56**	3.08***		21.00***	
<b>Personal skills Building</b>	Parameter	-0.04	0.32	0.05	0.01	0.03	7.30	0.38	92.70
	SE	0.04	0.09	0.04	0.02	0.01		0.02	
	t-value	-0.90	3.64***	1.18	0.75	2.73**		21.28***	
<b>Access to health services</b>	Parameter	0.01	0.34	0.05	0.02	0.01	2.95	0.46	
	SE	0.03	0.08	0.04	0.02	0.01		0.02	97.10
	t-value	0.35	4.38***	1.14	1.06	1.75		20.95***	
<b>HPS total</b>	Parameter	-0.07	0.25	0.03	0.01	0.03	9.10	0.26	
	SE	0.04	0.08	0.03	0.01	0.01		0.01	90.00
	t-value	-1.89	3.06**	0.79	0.64	2.89**		19.92***	

Significance level: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Figures in bold indicate significant effect. Intervention effect (time  $\times$  group interaction) was controlled in the analysis. Intercepts refers to **Parameter** refers to parameter estimate, **SE** refers to standard error, and **t-value** refers to the ratio of the parameter estimate to its standard error. t-value greater than 1.96 indicates significant effect.

Table 5 Staff characteristics and social capital indicators

Response variables		School size	School type	Main role	Years work	Variance explained		Variance explained	
						School level	%	Staff individual level	%
<b>Social capital 1: Feeling of trust and safety</b>	Parameter	-0.16	0.39	-0.01	0.02	0.11		0.35	
	SE	0.06	0.14	0.04	0.02	0.03		0.02	79.93
	t-value	-2.47**	2.73**	-0.16	1.60	3.79***	24.10	20.41***	
<b>Social capital 2: Proactivity in a social context</b>	Parameter	-0.06	0.16	-0.03	0.04	0.01		0.23	
	SE	0.03	0.06	0.03	0.01	0.01		0.01	95.80
	t-value	-2.19*	2.76**	-0.83	2.92**	2*	4.20	20.64***	
<b>Social capital 3: Tolerance of diversity</b>	Parameter	-0.01	0.19	0.04	0.02	0.09		0.48	
	SE	0.06	0.13	0.04	0.02	0.03		0.02	84.20
	t-value	-0.13	1.41	0.95	1.17	3.6***	15.80	21.82***	
<b>Social capital 4: Work connection</b>	Parameter	-0.04	0.23	-0.03	0.07	0.03		0.38	
	SE	0.04	0.09	0.04	0.02	0.01		0.02	
	t-value	-1.03	2.61**	-0.67	4.67***	2.73**	7.30	21.11***	92.70
<b>Social capital total</b>	Parameter	-0.07	0.22	-0.03	0.04	0.02		0.21	
	SE	0.03	0.08	0.03	0.01	0.01		0.01	89.80
	t-value	-2.00*	2.93**	-0.84	3.25***	3**	10.20	21.20***	

Significance level: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . Figures in bold indicate significant effect. Intervention effect (time  $\times$  group interaction) was controlled in the analysis. **Parameter** refers to parameter estimate, **SE** refers to standard error, and **t-value** refers to the ratio of the parameter estimate to its standard error. t-value greater than 1.96 indicates significant effect.

Table 6  
Relationship between the Health Promoting School approach and social capital

		HPS	Variance explained at school level (%)		Variance explained at individual staff level (%)	
<b>Feelings of trust and safety</b>	Parameter	-0.10	0.01	6.71	0.14	93.29
	SE	0.02	0		0.06	
	t-value	-4.25***			2.24*	
<b>Proactivity in a social context</b>	Parameter	-0.01	0	8.57	0.03	91.43
	SE	0.01	0		0.01	
	t-value	-1.00			2.29*	
<b>Tolerance of diversity</b>	Parameter	0.59	0.01	37.5	0.02	62.50
	SE	0.02	0		0.01	
	t-value	27.09***			2.14*	
<b>Work connection</b>	Parameter	0.09	0	4.17	0.07	95.83
	SE	0.01	0		0.03	
	t-value	6.70***			2.23*	

Significance level: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . SE refers to standard error.

Table 7

## Intervention effect on the Health Promoting School environment

Response variables		Intervention effect	Variance explained		Variance explained	
			School level effect	%	Individual level effect	%
<b>Health policy</b>	Parameter	0.12	0.02		0.34	
	SE	0.07	0.01	5.32	0.02	94.68
	t-value	1.75	2.38**		21.13***	
<b>Physical environment</b>	Parameter	0.19	0.06		0.38	
	SE	0.10	0.02	13.76	0.02	86.24
	t-value	1.88	3.53***		20.89***	
<b>Social environment</b>	Parameter	0.23	0.04		0.35	
	SE	.085	0.01	9.95	0.02	90.05
	t-value	2.72**	3.25***		20.76***	
<b>School-community relations</b>	Parameter	0.33	0.04		0.42	
	SE	0.09	0.01	9.48	0.02	90.52
	t-value	3.67***	3.14***		21.00***	
<b>Personal skills building</b>	Parameter	0.25	0.03		0.38	
	SE	0.08	0.01	7.49	0.02	92.51
	t-value	3.18***	2.82**		21.28***	
<b>Access to health services</b>	Parameter	0.10	0.03		0.46	
	SE	0.08	0.01	5.14	0.02	94.86
	t-value	1.35	2.50**		20.95***	
<b>HPS total</b>	Parameter	0.22	0.03		0.26	
	SE	0.07	0.01	9.12	0.01	90.88
	t-value	3.06***	2.89**		19.92***	

Significance level: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . SE refers to standard errors.

Table 8

## Intervention effect on social capital

Response variables		Intervention effect	Variance explained		Variance explained	
			School level effect	%	Individual level effect	%
<b>Feeling of trust and safety</b>	Parameter	0.39	0.11	24.24	0.35	75.76
	SE	0.13	0.03		0.02	
	t-value	2.98**	3.83***		20.41***	
<b>Proactivity in a social context</b>	Parameter	0.13	0.01	5.02	0.23	94.98
	SE	0.05	0.01		0.01	
	t-value	2.35**	2.40**		20.64***	
<b>Tolerance of diversity</b>	Parameter	0.19	0.09	16.08	0.48	83.92
	SE	0.12	0.03		0.02	
	t-value	1.53	3.54***		21.82***	
<b>Work connection</b>	Parameter	0.02	0.03	7.77	0.38	92.33
	SE	0.08	0.01		0.02	
	t-value	2.50**	2.91**		21.11***	
<b>Social capital</b>	Parameter	0.20	0.03	10.92	0.21	89.08
	SE	0.07	0.01		0.01	
	t-value	2.93**	3.25***		21.20***	

Significance level: \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . SE refers to standard error.

## Appendix 1. Social capital scale

1. Do you feel valued by this school?
2. Are you satisfied with your participation in this school?
3. How often do you help with cleaning up communal areas in the school, e.g., playground, tuckshop, corridor?
4. Do you feel safe walking around this school after dark?
5. Do people in this school feel trusted?
6. How often would a stranger needing help be invited into this school and offered assistance?
7. Is this school regarded as a safe place?
8. Does this school community feel like “home”?
9. How often do people in this school go to visit other schools?
10. Can you find important information in this school?
11. If you disagreed with people in this school about an important issue, would you feel free to speak out?
12. Would you ever seek mediation if you had a dispute with a staff member at this school?
13. Life in this school is richer because of the variety of cultures represented within the school community?
14. Are people of different lifestyles valued in this school?
15. If someone a bit “different” joins your school, would the school community accept them?
16. How often do you take the initiative to do what needs to be done even if no one asks you to do it at this school?
17. How often in the past week, have you helped another staff member in this school?
18. Do you feel part of the local community (neighbourhood) where you work?
19. Do you regard your colleagues at this school also as friends?
20. Do you feel part of a team at work?