

Examining the context of health promoting schools: a translational approach to characterization and measurement of school ethos to support health and wellbeing

Background: Health promoting schools (HPS) is hypothesized to influence student health and wellbeing by promoting a 'school ethos' that shapes the physical environment, social relations, organisational structure, policies and practices within the school. This complex set of conceptual dimensions makes school ethos challenging to measure as an important context for the implementation of HPS. The purpose of this research was to develop and explore a comprehensive measure of health promoting school ethos (HPSE) for the evaluation of HPS implementation, student health and well-being. Methods: We used a multi-method, iterative process to identify relevant HPSE concepts through triangulation of conceptual literature, existing tools and the tacit knowledge of school stakeholders. The HPSE measurement tool was administered to 18 elementary schools through a principal and teacher survey and an environmental assessment, followed by the development of a total and dimensional HPSE scores for each school. Testing for internal consistency of items was used to examine theorised concepts and sub-scores across HPSE dimensions, and total scores are summarised. Results: HPSE included eight conceptual dimensions with internal consistency ranging from $\alpha = 0.60$ to $\alpha = 0.87$. Total HPSE scores across schools ($N = 18$) ranged from 1 to 8 ($Mean = 3.94$, $SD = 2.1$), with 28% to 65% of schools reporting 'high' on respective HPSE dimensions. Conclusions: The HPSE tool holds potential for the conceptualization of critical components of school context as it relates to HPS. Schools included a heterogeneous mixture of health supportive school ethos, particularly among sub-dimensions.

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ABSTRACT

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Results: HPSE included eight conceptual dimensions with internal consistency ranging from $\alpha = 0.60$ to $\alpha = 0.87$. Total HPSE scores across schools ($N = 18$) ranged from 1 to 8 ($Mean = 3.94$, $SD = 2.1$), with 28% to 65% of schools reporting ‘high’ on respective HPSE dimensions.

Conclusions: The HPSE tool holds potential for the conceptualization of critical components of school context as it relates to HPS. Schools included a heterogeneous mixture of health supportive school ethos, particularly among sub-dimensions.

Implications to policy and practice: Our research suggests that multi-dimensional conceptualisation and measurement of a complex concept, such as HPSE, may help us to better understand school ethos, and improve future implementation of a HPS approach. Further research is needed to determine if the HPSE is associated with improved health outcomes and well-being, which may ultimately help guide HPS implementation.

Introduction

Schools are an important intervention setting to improve the future health and wellbeing of children through enhancing learning, providing social support, and establishing lifelong healthy habits (1,2). This capacity has been recognized internationally through recommendations that encourage a health promoting schools (HPS) approach (3,4). In Canada, HPS is often referred to as “Comprehensive School Health” and focuses on four interrelated principles of action: Social and Physical Environment, Teaching and Learning, Partnerships and Services, and Healthy School Policy (5). Regardless of the term, HPS is hypothesized to influence student health and well-being by facilitating improvements in the physical environment, social relations, organisational structure, policies and practices within the school that in turn support the health and wellbeing of children (3,4). The implementation of a HPS approach is complex as it introduces changes across a broad range of conceptual dimensions that vary according to the needs or capacity and context of each school (6,7). Consequently, the evaluation of HPS interventions and measurement of conceptual dimensions is challenging and complex (8). School ethos is one conceptual dimension that represents the various physical and psychosocial structures that shape school environments (9) and although understood as being essential for HPS (10,11) there is a lack of published research that describes the relationship of school ethos to the overall HPS approach or how it can be measured. Therefore, the purpose of this research was to capture school context supportive of health and wellbeing and develop and pilot an appropriate measure.

Background

A HPS approach uses a broad ecological model, with a focus on creating school and community environments to support health behaviours of students, thereby influencing health and learning outcomes (3). While HPS interventions hold a great deal of promise for supporting the lifelong development of healthy behaviours in children (12–14), challenges persist in their implementation and evaluation (6,7,15,16). HPS is complex and multifaceted, in part because implementation occurs gradually over time and school practices might develop, innovate or adapt in response to specific policies or contextual factors (17,18). As a result, schools adopting a HPS approach may not fulfill all core principles of the approach. Health promoting practices may also exist in schools that do not formally adhere to a HPS approach due to the traditional focus on health and physical education in schools (19).

School ethos has been described as the various physical and social structures that shape a school’s context including, administrative support and leadership, staff support, school connectedness, morale and stability, and financial and human resources (9). That is, school ethos could represent the entire collection of structures and processes that collectively represent the context of a given school. However, school ethos, or a school context for supporting the health and wellbeing of students, lack a clear definition or evidence of how a health promoting school ethos (HPSE) aligns with the core principles of HPS interventions (20,21). Figure 1 outlines how a HPSE might help us to better understand how HPS initiatives might translate into improved student wellbeing.

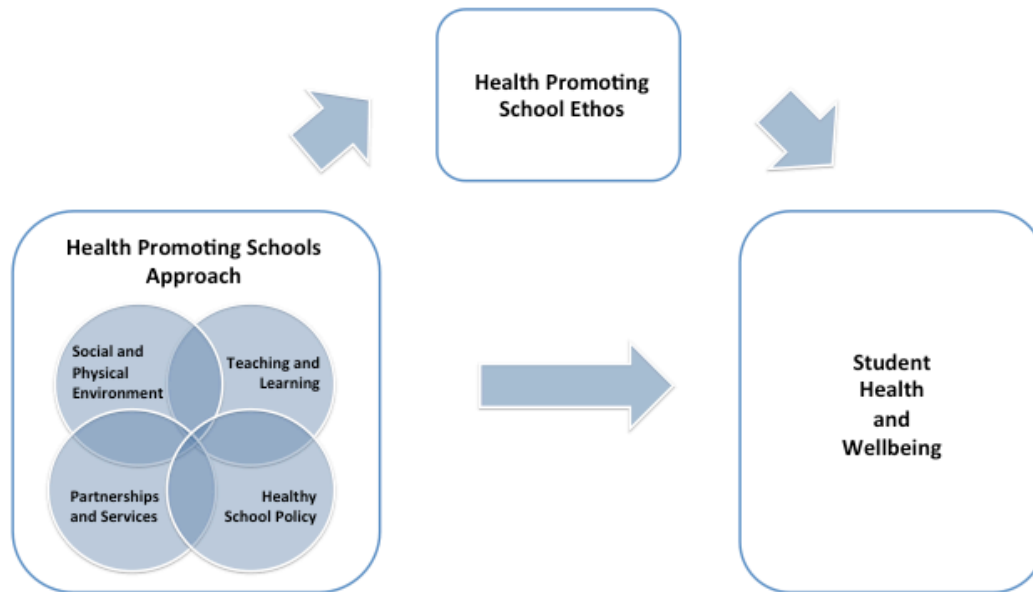


Figure 1: Framework demonstrating hypothesized relationship between health promoting schools, the context of health promoting school ethos and student health and wellbeing.

The measurement of contextual aspects and connection to health outcomes in existing school ethos tools and literature is sparse, and the link between measurement items and theoretical components is often unclear (20–25). Measurement of a HPSE in the context of HPS is more complex as its manifestation is based on core principles of action unique to a HPS approach (Social and Physical Environment, Teaching and Learning, Partnerships and Services and Healthy School Policy). This inherent complexity may not be well suited to traditional approaches to measurement development. Current processes for developing theory and measures for intervention evaluation are often procedurally rigid and inductive, typically starting with literature review to identify important concepts or theory then operationalizing and measuring predictive factors and outcomes (26,27). However, these methods may have limited success in accurately characterizing the role of varying contexts in which the intervention is implemented (i.e., the health promoting ethos within a school), suggesting that a more nuanced approach may be warranted. Alternative methods of theory development and evaluation allow for flexibility in the development of theory and measurement tools to accommodate contextual considerations for programs or initiatives, while maintaining scientific rigour (28–31). This includes prioritizing a sound theoretical foundation, documentation of processes, and greater transparency and details in reporting results (28,29).

Purpose of research

To address this gap in research, we used a translational (i.e., process driven) method to develop and explore a measure of HPSE with the potential to explain differences in student health and wellbeing across heterogeneous school contexts.

Methods

While tool development procedures typically begin with a conceptual framework from the literature or by adapting an existing tool, the relevance of such tools to the actual context of schools is a critically important consideration for research (30). We therefore applied a

translational model of knowledge to action (multi-source model with knowledge funnel) (32) to the characterization and tool development by triangulating theoretical components, existing HPS tools and the tacit knowledge of project knowledge users. We used a three-phase, multi-method, iterative process to develop and assess a HPSE (Figure 2). Based upon the conceptual framework and measurement items derived, a measurement tool was piloted and delivered to all participating schools.

Sample and setting

Our study included teachers and principals of 18 schools in a rural school board in Nova Scotia (Canada) with a population of approximately 60,000 people. This school board was involved in a provincial HPS initiative, with 10 schools having adopted the HPS approach at the time of data collection. However, reflective of the real-world nature of this study, health promoting activities were present in all 18 schools, as a result of mandatory nutrition policy and school health curricula and an emphasis on afterschool physical activities and mental wellbeing across the province. Throughout the project we used principles of integrated knowledge translation to ensure the research was conducted according to stakeholder knowledge needs so that the results would help to inform policy and practice (33). Establishing a research advisory committee and communicating regularly with knowledge users to guide the development of the research methods, instrument design, data collection, and dissemination strategies addressed these potential needs.

Procedure for HPSE Characterization and Measurement

The three phases applied in this study were 1) characterization and development of the measurement tool, 2) administration to schools and 3) calculation of a score (see Figure 2).

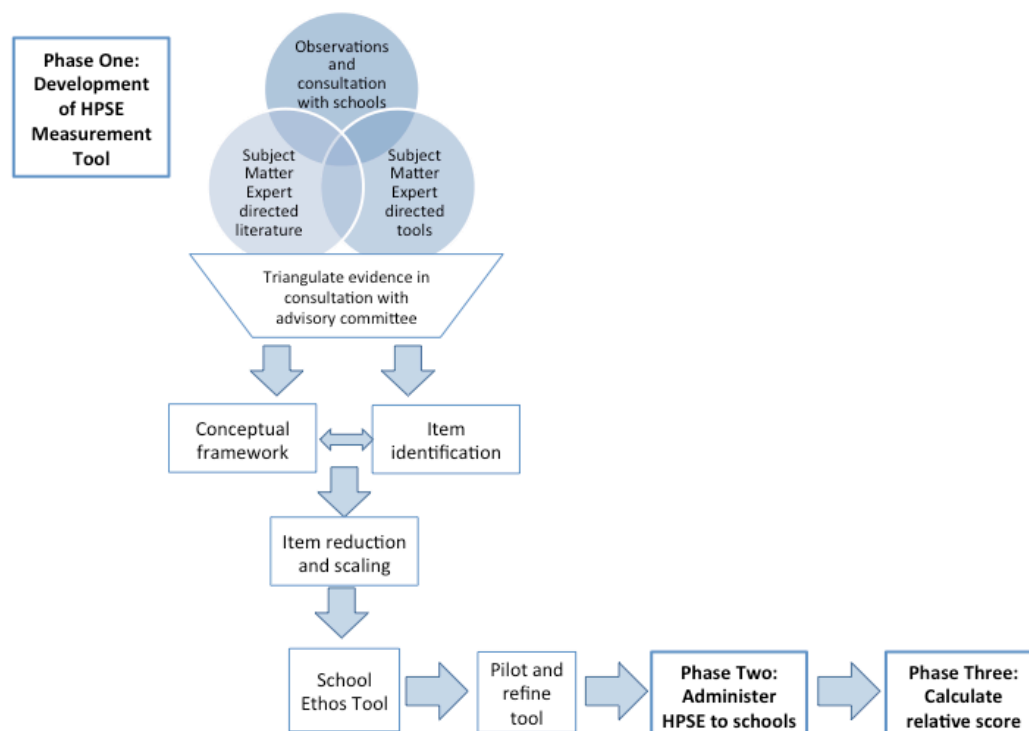


Figure 2: Procedure for development of Health Promoting School Ethos Measurement

Phase One: Development of HPSE Measurement Tool

Through literature review, tool identification and consultations with schools and subject expert tacit knowledge, we identified potential theoretical components relevant to a supportive school ethos or a health promoting school. Most relevant evidence was prioritised to ensure that theoretical concepts were based on current conceptualisations of HPS and we applied an iterative approach to refine our approach to tool development. A collection of HPS measurement tools were also identified by academic and non-academic partners. Tools in active use that held conceptual coherence with HPS used in this project were also prioritised. Finally, engagement of project knowledge users (i.e., schools) was a key element of this project. As we reviewed literature and developed the tool we regularly consulted with stakeholders involved with supporting the implementation of HPS at a board-level to ensure meaningfulness of the data being collected. We also consulted with school principals to inquire about their perspectives on what contributes to school ethos to enable their school to support health and wellbeing.

The evidence generated from these three evidence sources were triangulated to co-create the conceptual framework. Theory based literature was reviewed for relevant constructs, which were screened and discussed by the lead authors (TLP and JLM). These concepts were presented to the advisory committee and feedback was sought to identify potential missing concepts relevant to them. Items from existing measurement tools were then examined and cross-referenced with theoretical concepts and grouped by the lead authors (TLP and JLM) with advice from the scientific team (KS, SK, SFLK) and disagreements were discussed (34). Items were reviewed again by team and redundant items were removed. Concepts provided from knowledge users not included in existing measurement items were added to ensure relevance of tool. The tool was pilot tested in one school by one of the lead authors and refined following discussion by the team.

Phase Two: Administer HPSE Measurement Tool

Data collection was completed in spring 2014 following ethical approval from the Dalhousie Health Research Ethics Board and permission from the participating school board. We collected information on HPSE through surveys from school leaders and teachers and an audit of the school environment by a trained observer allowing for allowed for a rich source of data for each concept. The audit was completed through a “walk-around” of the school following guided plan that related to specific aspects of the school related to our measure of HPSE. This audit was completed with support of a school staff member and included photographs to capture physical features and responses to questions related to various aspects of HPSE (e.g., resources and promotion for healthy eating, access and availability to physical activity, safety and accessibility of the school). Photos were used to provide an objective assessment of relevant concepts using an assessment tool (Appendix 1) to rate the presence and degree of a particular concept (scale from 1 – 5) from each photo (JK and TLP).

Phase Three: Development of HPSE Score

Relative scores were created for each dimension of the conceptual framework. This was accomplished by taking items that were categorised from a combination of sources (i.e. teacher survey, principal survey, observational audit with rated photographs) into separate indicators. Each dimension of HPSE comprised an indicator that was tested for internal consistency. To allow for flexibility in the conceptual development of HPSE without

excluding constructs at this early stage, a liberal alpha was chosen. Therefore, when internal consistency was < 0.6 or poor to unacceptable, similar indicators were combined until the alpha was ≥ 0.6 . Indicators for constructs were calculated as row-means of items, which were then recoded as being above ($=1$) or below ($=0$) the median for the indicator score. Finally, indicator scores were summed to create an overall HPSE score.

Results

HPSE Theoretical Constructs and Measurement

The final HPSE tool (see authors for full tool) included measurement items developed from the triangulation of conceptual literature regarding school ethos and HPS (Appendix 2), existing measurement tools for comprehensive school health (Appendix 3) and consultation with project knowledge users (Appendix 4) resulted in ten constructs. These were operationalized for measurement to collectively represent a set of theoretical constructs for a HPSE (Table 1). Given the range of concepts, measurement items included data from surveys, auditor observations, and photographs.

Table 1: Resulting constructs for health promoting school ethos (HPSE) measurement

| Original HPSE Construct Dimensions | Definition |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Aesthetics | School features for different areas (i.e. grounds, classrooms, school entrance etc.) that are pleasant to look at, or improve the overall feeling of a space (e.g. the play area is spacious and pleasant to look at, it is clean, well maintained, colourful etc.). |
| Safe surrounding | School features that support awareness of and action to address threats to safety (e.g. there is a guarded cross walk near the school) in different areas of the school (i.e. crosswalks, play areas, hallways etc.). |
| Connectedness | Fostering relationships between students, and between students and staff (e.g. safe places to interact, student engagement through visual cues). |
| Sense of belonging | Engagement of students and staff and their feeling part of the wider school community. |
| Consciousness of health | Awareness, value and prioritization of health and wellbeing in the school and school curriculum. |
| Reinforcement of health | Reinforcing health promoting behaviours through modelling, incentives/disincentives and feedback from staff to students. |
| Healthy curriculum | Curriculum and specific classroom activities that equip students with knowledge, skills and attitudes to lead healthy lives outside of the school setting. |
| Resources | School features that indicate the socioeconomic status of a school that could support student health (e.g. large open areas to play with quality play equipment or many different kinds of sport equipment to use). |
| Availability | School features present for different parts of the school (i.e. cafeteria, grounds, hallways, classrooms, etc.) that supports healthy eating, physical activity and mental wellbeing for students (e.g. there is a bowl of fruit on a desk or a soccer ball in a room). |
| Accessibility | The ease or difficulty in using school features that exist to support healthy eating, physical activity and mental wellbeing for students (e.g. the bowl of fruit is behind the teachers desk and difficult to reach or the soccer ball is in a locked room) across different areas of the school (i.e. grounds, classrooms, cafeteria, etc.). |

HPSE Score

The final HPSE included eight conceptual dimensions (connectedness/sense of belonging and healthy curriculum/reinforcement of health were combined) with internal consistency (Cronbach's Alpha) ranging from 0.60 to 0.87. Total HPSE score across schools ($N = 18$) ranged from 1 to 8 ($Mean = 3.94$, $SD = 2.1$), with 28% to 65% of schools reporting high levels of respective HPSE dimensions (Table 2). The most common dimensions rating high were: Consciousness of health, Safe surroundings, and Availability. The least common dimension with a high rating was Reinforcement of health.

Table 2: Summary of health promoting school ethos (HPSE) score results for eight conceptual dimensions (n=18 schools)

| Final HPSE Construct Dimensions | No. Items | alpha | No. Rated High | % Rated High | Data Sources |
|---------------------------------|-----------|-------|----------------|--------------|---------------------------------------|
| Consciousness of health | 13 | 0.71 | 10 | 56 | Principal and teacher survey |
| Safe surrounding | 11 | 0.63 | 10 | 56 | Principal survey and photo assessment |
| Reinforcement of health | 15 | 0.74 | 5 | 28 | Teacher survey |
| Sense of belonging | 26 | 0.80 | 9 | 50 | Principal and teacher survey |
| Availability | 24 | 0.67 | 10 | 56 | School environment audit |
| Accessibility | 9 | 0.60 | 9 | 50 | Photo assessment |
| Aesthetics | 10 | 0.74 | 9 | 50 | Photo assessment |
| Resources | 12 | 0.87 | 9 | 50 | Photo assessment |

The number and nature of highly ranked dimensions varied greatly between schools. One school rated high on all eight dimensions, two schools rated high on seven dimensions, two schools rated high on six dimensions, two schools rated high on five dimensions, seven schools rated high on three dimensions, two schools rated high on two dimensions and two schools rated high on only one dimension (Table 3).

Table 3: Health promoting school ethos (HPSE) score distribution of dimensions by schools

| Final HPSE Construct Dimensions | High Scores by School | | | | | | | | | | | | | | | | | |
|---------------------------------|-----------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| Consciousness of Health | X | X | | X | | | X | X | X | X | | | | | X | X | X | |
| Safe surroundings | X | X | X | | X | | X | X | X | | X | X | | | X | | | |
| Reinforcement of Health | X | X | | | | | X | X | | | | X | | | | | | |
| Sense of Belonging | X | | X | X | | | X | X | | | | X | | X | X | | | X |
| Availability | X | X | | | | X | X | | X | X | X | | | X | X | | | X |
| Accessibility | X | X | X | X | X | X | | | | | | | X | | | | | X |
| Aesthetics | X | X | | | X | | X | X | X | | | X | | | X | | | X |
| Resources | X | X | | | | X | X | X | X | | X | X | | | X | | | |
| Total | 8 | 7 | 3 | 3 | 3 | 3 | 7 | 5 | 6 | 2 | 3 | 5 | 1 | 2 | 6 | 1 | 3 | 3 |

X: row-means of construct items above the median construct score.

Discussion

The HPS approach is hypothesized to positively influence the health and wellbeing of students. However, existing school culture or ethos may be an important consideration in understanding school context for implementation or evaluation of HPS. Evaluation of school-based population health interventions, like HPS, contain additional challenges given that researchers seek to evaluate interventions that are led and maintained outside of the academic sphere, often within short timeframes and under circumstances with restricted resources (35). Therefore, to better characterize school context for the evaluation of an HPS approach, we employed a novel method to measure HPSE and develop a score to capture this multidimensional construct for each school.

Reflections on characterizing and measuring a HPSE

Characterization of HPSE resulted in eight final dimensions found across relevant literature, existing tools and provided by the tacit knowledge of the project stakeholders. Previous research has explored many of the conceptual dimensions that are important for various aspects of school, teacher, and student outcomes. These dimensions include the importance of aesthetics in relation to the satisfaction of students and teachers; safe surroundings in relation to emotional and physical wellbeing of students (36) and perceptions of organizational satisfaction (37); sense of belonging and the emotional health of students in terms of their acceptance and experience of membership in a community (38); consciousness of health and the dissemination of health messages through school curricula and other practices to influence the beliefs and behaviours of students (39); reinforcement of health to support teacher-student relationships (40) and modelling of health behaviours (41); resources and the capacity of schools to provide support to teachers and students (42); and the availability and accessibility of how the school environment (e.g., infrastructure, equipment or food) influences healthy behaviours in students (43). The breadth of the dimensions demonstrates the importance of multiple evidence sources for this work, particularly the contextualized knowledge provided by the school stakeholders (44). Similar to other population health interventions, researchers were not involved in the development or implementation of the intervention (35) but maintained engagement with knowledge users from the very early stages of the project. This partnership was key to ensuring that the tool was not only methodologically and theoretically sound, but that it could capture the context of schools in order to support further implementation of HPS in this region.

Developing a HPSE score

The HPSE scores varied greatly across a number of health supportive school ethos concepts. This may demonstrate the complexity of school context, the importance in understanding this context before HPS implementation takes place (7,16,45) and the need for adaptability of the HPS approach based on contextual priorities of schools (46). Some schools may not require all aspects of the HPS approach; perhaps some schools are well resourced, but lack of a consciousness of health that is needed to support a HPSE for a more fully developed HPS approach. As previous research has suggested, each school is unique and reflects the leadership, students, parents and community it serves, creating a large variation in school context that requires careful consideration prior to HPS implementation (18).

Flexibility of translational approach

A potential strength of a translational approach to characterization and measurement is the potential to adapt to other school contexts. For instance, the HPSE tool was created to include the process of engaging a range of stakeholders. This allowed for the inclusion of concepts

that were important to knowledge users, but may not have been reflected in the literature or existing measurement tools (31). In addition to engagement, the observational school audit allowed for the collection of photographs of each individual school. The analysis of these photos provided the means to introduce complex contextual variation within and between schools that may not have been as robustly captured through surveys or auditor checklists (47), contributing to enriching qualitative concepts including aesthetics, resources and safe surroundings. This can support detecting subtle differences between HPS and non HPS school environments or practices that may otherwise go undetected (48). The use of these methods may also create challenges for the on-going validation of measurement tools using traditional methods, and more work to determine the impact of measuring and assessing context is needed.

Limitations

The HPSE score was developed to provide a relative score for schools, rather than an objective score that may outline specific conditions that would constitute health promotion at a school and assessment would include whether or not a school meets that criteria (e.g. if every school has a specific HPS initiative or not). Also, to allow for flexibility in the conceptual development of HPSE a liberal alpha was chosen (≥ 0.6), this requires further analysis in relation to study outcomes to determine their validity. In addition, assessment of photos was used to contribute to several of the HPSE dimensions. However, these photos may have missed or not captured other important aspects of the school environment despite training and providing the research assistants with a guided audit tool to direct photo capture.

Given the range of theoretical dimensions collected, developing appropriate measures that were sound and had minimal burden to school staff was a challenge (49). This required the use of short surveys for principals and teachers, in order to better understand staff consciousness of health, school sense of belonging, reinforcement of health in the curriculum and the policy context. Comparatively, aspects of the physical environment including accessibility, availability and safe surroundings required trained researcher assistants to conduct an observational audit and take photos to assess these dimensions. The complex nature of the concepts and data also makes traditional validation challenging, as the translational approach to theory development and measurement employed here can create different constructs for measurement when used in a new context. In addition, it relies heavily on well trained auditors and careful photography. Even though data collectors had been trained, school audit data was sometimes incomplete, or completed with supplementary details that required interpretation. In these instances, consensus was reached and new variables were coded where needed. Finally, collecting some of the social dimensions of school ethos was challenging from both tools used: the survey (where social desirability bias can dominate) and the audit (where it is difficult to capture social interaction). An enhanced approach could include observational methods, where auditors observe social interactions between students and staff – however, this would add additional burden to the data collectors, school and additional resources from typically low resourced evaluations in population health intervention research.

Conclusions

A translational approach had both advantages and disadvantages on the development of a measurement tool to capture differences in HPSE across schools to foster the health and wellbeing of children. This process and score may be a useful beginning to refining and testing a reliable, valid measurement approach that is adaptable to different contexts. Future

tools seeking to measure contextual circumstances of settings where health and wellbeing are an important factor should seek innovative ways of capturing the range of evidence sources and combining them using a sound theoretical basis. This will help move the knowledge base forward and support population health intervention researchers to better capture important contextual influences.

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