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Review Article

School environment assessment tools to address behavioural risk factors of non-communicable diseases: A scoping review

Kiran Saluja[a], Tina Rawal[a], Shalini Bassi[a], Soumyadeep Bhaumik[a], Ankur Singh[b,c], Min Hae Park[d], Sanjay Kinra[e], Monika Arora[a,*]

[a] Health Promotion Division, Public Health Foundation of India, India
[b] Australian Research Centre for Population Oral Health (ARCPOH), Adelaide Dental School, The University of Adelaide, Australia
[c] Centre for Health Equity, Melbourne School of Population and Global Health, University of Melbourne, Australia
[d] Department of Health Services Research and Policy, Faculty of Public Health and Policy, London School of Hygiene and Tropical Medicine, United Kingdom
[e] Department of Non-Communicable Disease Epidemiology, Faculty of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, United Kingdom

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ABSTRACT

We aimed to identify, describe and analyse school environment assessment (SEA) tools that address behavioural risk factors (unhealthy diet, physical inactivity, tobacco and alcohol consumption) for non-communicable diseases (NCD). We searched in MEDLINE and Web of Science, hand-searched reference lists and contacted experts. Basic characteristics, measures assessed and measurement properties (validity, reliability, usability) of identified tools were extracted. We narratively synthesized the data and used content analysis to develop a list of measures used in the SEA tools.

Twenty-four SEA tools were identified, mostly from developed countries. Out of these, 15 were questionnaire based, 8 were checklists or observation based tools and one tool used a combined checklist/observation based and telephonic questionnaire approach. Only 1 SEA tool had components related to all the four NCD risk factors, 2 SEA tools has assessed three NCD risk factors (diet/nutrition, physical activity, tobacco), 10 SEA tools has assessed two NCD risk factors (diet/nutrition and physical activity) and 11 SEA tools has assessed only one of the NCD risk factor. Several measures were used in the tools to assess the four NCD risk factors, but tobacco and alcohol was sparingly included. Measurement properties were reported for 14 tools.

The review provides a comprehensive list of measures used in SEA tools which could be a valuable resource to guide future development of such tools. A valid and reliable SEA tool which could simultaneously evaluate all NCD risk factors, that has been tested in different settings with varying resource availability is needed.

1. Background

The shift from United Nation's Millennium Development Goals to the Sustainable Development Goals (SDG) reflects a paradigm shift in terms of strategies to reduce premature mortality due to non-communicable diseases (NCDs) (UN, 2016). Tobacco use, physical inactivity, unhealthy diet and harmful alcohol use are the key behavioural risk factors responsible for significant mortality and morbidity due to NCDs (GBD 2015 DALYs and HALE Collaborators, 2016). These behaviours become established in childhood and adolescence (WHO, 2009) and contribute to overweight/obesity, raised blood pressure, raised blood glucose and dyslipidaemia (Li et al., 2013), which are precursors to adult chronic diseases. The prevalence of NCDs in children and youth is also increasing with decreased age of onset of these diseases (WHO, 2014). The WHO's voluntary global NCD targets aim to achieve country specific reductions in NCD risk behaviours and halt the rise of obesity and diabetes among adolescents and adults (WHO, 2014). Achieving these goals could substantially prevent premature heart disease, premature stroke, type 2 diabetes and cancer (WHO, 2005). Therefore, it is necessary to establish healthy behaviours earlier in life to prevent NCDs throughout the life-course.

Schools are uniquely positioned as an ideal setting to promote and reinforce healthy behaviours among children and adolescents (Singh et al., 2017). However, the extent to which 'school environments' have become unhealthy in recent years is a cause of major concern in both developed and developing countries (Story et al., 2009), (Meenakshi et al., 2012). Studies have shown that inadequate school built environment and school-level policies may negatively impact body mass

* Corresponding author at: Public Health Foundation of India, Plot No. 47, Sector 44, Institutional area, Gurgaon 122022, India.
E-mail address: monika.arora@phfi.org (M. Arora).

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index, (Galvez et al., 2010), (James et al., 2012), (Williams et al., 2013), (Duncan et al., 2014) physical activity and dietary behaviours (Jaime and Lock, 2009) among children. Concurrently, studies have shown that school policies and curriculums can positively impact on behaviours related to NCD risk factors, such as reducing tobacco use, intention and susceptibility (Arora et al., 2011), promoting physical activity and healthy dietary habits (Saraf et al., 2015).

Building on the Ottawa Charter for Health Promotion (1986) and the Jakarta Declaration for Promoting Health (1997), WHO has launched the Global School Health Initiative to increase the number of health promoting schools worldwide (WHO, 2017a, 2017b). The recent Shanghai Declaration also reaffirms the stand as it calls for health being created 'in the settings of everyday life' (WHO, 2016). Periodic assessment of school environments and its impact on NCD risk behaviours is imperative to ensure that schools are health promoting and discouraging unhealthy behaviours. This requires appropriate school environment assessment (SEA) tools that can be culturally adapted and contextualized in different settings. In spite of interest in building better school environments to modulate behavioural risk factors, there exists no comprehensive review of SEA tools for the four key behavioural NCD risk factors. We aimed to identify, describe and analyse SEA tools that address behavioural risk factors for non-communicable diseases (i.e. unhealthy diet, physical inactivity, tobacco and alcohol consumption).

2. Methodology

2.1. Justification of study design

We chose a scoping review design over other evidence synthesis methodologies, to develop understanding of the extent, range and nature of school environment tools (Hilary and Lisa, 2007). Methodological quality assessment for individual studies was not conducted as the aim of the study was to identify the types of SEA tools and measures available, rather than to evaluate the quality of studies (Levac et al., 2010).

We conducted content analysis to analyse the SEA tools. Content analysis enables drawing of inferences by coding textual materials in a valid and replicable manner, by systematically evaluating documentary materials.

2.2. Criteria for including studies in the review

We conducted a scoping review of studies which have described tools to assess school environment specifically in relation to behavioural NCD risk factors (unhealthy diet, physical inactivity, tobacco and alcohol consumption). The detailed inclusion and exclusion criteria are given in Table 1.

2.3. Search methods for identification of studies

2.3.1. Electronic searches

We searched two electronic databases MEDLINE [Ovid] and Web of Science for articles published from 1990 onwards (last searched on 4th January 2014). We developed a search strategy for MEDLINE by combining key concepts related to the study as follows:

- School environment
  [(school.mp. or exp Schools/ AND exp Environment/ or environment.mp.) OR school environment.mp. OR (school adj6 environment).mp. OR exp. Policy/ OR (school adj3 policy).mp. OR school health.mp. or exp. School Health Services/),
- Assessment and research tools
  evaluat$.mp. OR observ$.mp. OR measur$.mp. OR assess$.mp. instrument$1.mp. OR scale.mp. OR tools.mp. OR questionnaire.mp. or exp Questionnaires/
- NCD risk factors
  exp Obesity/ or obes$.mp. OR life style.mp. or exp. Life Style/OR diet$.tw. OR eat$.tw. OR nutrition$.tw. OR (physical adj1 activit $).tw. OR exercise.tw. OR play.tw. OR (tobacco or alcohol).mp.
- Children and adolescents
  (child$ or adolescent$).mp. NOT (infant or preschool OR adult$ or pregnan$).mp.

The above search strategy was tailored and adapted for Web of Science.

2.3.2. Searching other sources

We hand searched the reference list of eligible articles found by other methods, and contacted authors of included studies and experts in the field (including personnel in education sector identified vide contacts of review authors and published articles) to identify relevant studies and grey literature.

2.4. Selection of studies

After removing duplicates using Endnote 6, two authors (KS and AS) independently screened all records based on the article titles to exclude obviously ineligible articles. Abstracts of records not excluded at this stage were independently assessed for eligibility by KS and AS. Full texts of all articles not excluded at the abstract-screening stage were obtained and independently reviewed by KS and TR to assess final inclusion as per eligibility criteria. Any disagreements, at any phase, were resolved by discussion to build consensus.

2.5. Retrieving the identified tools and their quality assessment

The SEA tools were obtained through the following methods when articles consistent with our eligibility criteria did not include tools in either full text or supplementary material:

- Searching the name of the tool and/or the study in Google Search engine
- Requesting the corresponding author for the complete school environment assessment tool through email

Table 1
Eligibility criteria for inclusion and exclusion of school environment assessment tools.

Inclusion criteria	Exclusion criteria
1. School environment tools to specifically evaluate the environment related to behavioural NCD risk factors (i.e. unhealthy diet, physical inactivity, tobacco and alcohol consumption) in schools. School environment in this context refers to all school-level attributes which directly or indirectly influence NCD risk factors among children and adolescents. These include built environment of the schools and the formal or informal school level policies and activities which informs health behaviours and knowledge of NCD risk factors among children and school staff. 2. Published in English Language 3. Published on or after 1990.	1. Tools which have assessed educational environment, or school mental health. 2. Tools which have assessed environment in pre-schools, colleges (degree schools), or schools for especially abled individuals. 3. Tools exclusively assessing behaviours, knowledge, attitude and practices of children/school staff without assessing other determinants related to school activities or policies. 4. identified records in which neither the full tool nor the psychometric properties were retrieved.