Understanding school health environment through interviews with key stakeholders in Lao PDR, Mongolia, Nepal and Sri Lanka

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Received on April 21, 2014; accepted on November 12, 2014

Abstract

Studies on health promoting schools (HPS) in low- and middle-income countries (LMICs) are scarce. To contribute to the development of HPS in these countries, we conducted formative research to understand the school environment in Lao PDR, Mongolia, Nepal, and Sri Lanka. Forty-three teachers, 10 government workers and 5 parents participated in three one-on-one interviews and 14 natural group interviews. Six themes emerged that centered on insufficient resources as reasons for suboptimal health conditions. At the individual level, participants mentioned the deficiency of personal resources to cope with cold weather and poor diet. At the school level, the lack of physical resources such as water purifiers and latrines was discussed. Interviewees also pointed out the schools’ overdependence on external resources and therefore the lack of sustainability. Last, the shortage of health services at the school and community level was commonly mentioned. Based on these results, we believe that the basic concept of HPSs should also be applied when working with schools in LMICs. In conclusion, there was a lack of perception of the importance of policy and capacity development programs, which are important in developing HPSs. Therefore, future school health programs should stress improving these elements.

Introduction

Low- and middle-income countries (LMICs) have greatly improved young child survival and development in the last half century, yet the same improvement has not been observed among adolescents. Childhood mortality is reported to have declined by >80%; however, the mortality of adolescents aged 10–24 years has only marginally improved in the past 50 years [1]. The global leading causes of the deaths of young people are injuries (mainly road traffic accidents), maternal causes, communicable diseases such as tuberculosis, meningitis and HIV/AIDS and non-communicable diseases (NCD) [2, 3]. In addition, the mortality rates of adolescents are almost four times higher in LMICs than in high-income countries [4]. Risk behaviors such as smoking, an unhealthy diet and physical inactivity that lead to NCD in later life are increasing rapidly among adolescents in LMICs [2, 3]. Thus, adolescents in these countries face high levels of risk for both communicable and non-communicable diseases.

To counter these risks is seen as a task for schools, which are regarded as the key setting for health promoting programs. In addition to providing knowledge for improving student health, schools provide a suitable environment for students to develop health skills [5, 6]. Comprehensive school health approaches such as health promoting schools (HPS) from the World Health Organization and...
the Coordinated School Health Program (CSHP) from the US Centers for Disease Control and Prevention have been implemented worldwide. These comprehensive approaches include school policy, skill-based health education, services and a healthy environment [7, 8]. Comprehensive school health approaches are consistent with the social ecological model, which emphasizes the dynamic interaction of intrapersonal and environmental factors in health and illness [9, 10].

The literature has shown that comprehensive approaches to school health promotion such as the HPS and the CSHP have impacts on some aspects of student health. Although further long-term follow-up research is required, the current data show that mental health, healthy eating habits and physical activity can be improved through comprehensive school health programs [11, 12]. In addition, school health programs have shown effects in reducing risk-taking behaviors such as alcohol and tobacco use, unwanted pregnancies and sexually transmitted disease, as well as improving educational outcomes such as secondary school completion and educational attainment [13, 14]. Although the effectiveness of school health programs has been established and provides scientific evidence for an action, most studies have taken place in high-income countries but less research has been reported in LMICs [13]. Therefore, to develop comprehensive school health programs using the HPS concept in LMICs, we designed a Healthy School Development Project (HSDP).

The HSDP is part of the Facility for Capacity Development for Poverty Reduction through South–South and Triangular Cooperation supported by the Ministry of Education, Science and Technology of the Republic of Korea (ROK) and the United Nations Development Programme (UNDP). This facility aims to expedite the country’s sharing of knowledge in these sectors in support of countries aspiring to meet the UN Millennium Development Goals. Thus, the HSDP aims to develop school capacity for improving health among school members and the school environment through tailored school health programs in low- and middle-income Asian countries, particularly in Lao PDR, Mongolia, Nepal and Sri Lanka.

The long-term goal of the HSDP is to improve education and to reduce poverty in these countries through improved health outcomes.

In 2010, the ROK became the 24th member of the Development Assistance Committee of the Organization for Economic Co-operation and Development (OECD) as a donor country. Since then, the ROK has been trying to expand foreign aid and to share its past developmental experiences with other LMICs. It is meaningful for the ROK to work with LMICs because it is the only country in the world that has switched from a recipient to a donor country. Through sharing the ROK’s experience and knowledge, the HSDP was designed to improve school health in Lao PDR, Mongolia, Nepal and Sri Lanka.

As the first step of the HSDP, we were confronted with a scarcity of information on school health environments and key stakeholder perceptions of school health in the countries that we work with. In order to develop effective school health programs both culturally and geographically appropriate for participating countries, formative research before the actual intervention implementation is key to program success. The formative research involved gathering information to understand the views of key stakeholders. This step of research helps to recruit and keep study participants and to decide on measurement procedures and acceptability. Moreover, well-implemented formative research helps to improve the acceptability of the interventions [15]. Specifically, understanding the school health environment and how people perceive the environment are important in planning and implementing successful school-based health programs [16]. Thus, this study conducted direct observations and interviews to collect data to understand school health environments and key stakeholders’ perceptions on school health in Lao PDR, Mongolia, Nepal and Sri Lanka, and to develop intervention programs. In addition, this study addresses the following key research questions: (i) what are the general health issues among students as described by the key stakeholders (principals, teachers, local and regional government officers) in the four
Materials and methods

This study was conducted as part of the first phase of the HSDP to develop an intervention program based on school needs. Lao PDR and Nepal were selected because they meet the UN criteria for least developed countries. Based on cultural and geographic similarities with Lao PDR and Nepal, Mongolia and Sri Lanka were selected among the LMICs to develop Southern-driven partnerships among the four developing countries. The partners of the HSDP in the four participating countries included education authorities and health authorities of the central or local governments, and community-based NGOs.

In spring 2012, recruitment for the study participants was begun by the project partners in Lao PDR, Mongolia, Nepal and Sri Lanka. Schools were considered eligible if they were public schools and were located in urban or semi-urban areas that have had relatively little exposure to international projects and had enthusiasm for improving school health. Three urban or semi-urban areas and one rural area were selected as the project sites: the Pek district in Xiangkhouang province in Lao PDR, the Bhaktapur district in the Bagmati zone in Nepal, Darkhan in Darkhan-Uul province in Mongolia and a suburb of the Colombo district in the Western Province in Sri Lanka. Fifteen public schools from the four project sites were identified that met the eligibility criteria and agreed to participate in this study. Fourteen principals (6 females), 29 teachers (21 females) and 5 parents (2 females) from the schools and 10 education and health authorities (6 females) participated in the one-on-one or natural group interviews at their schools or offices (Table II). These participants were recruited through local partners. The interviews were conducted from May to July 2012.

Approval for the study was obtained from the National Institute of Education of Sri Lanka, the Ministry of Health of Lao PDR, the Health Department of Darkhan province in Mongolia and the Education Department of Bhaktapur district in Nepal. Written informed consent translated into the national languages was obtained from all participants before the interviews.

To understand the multilevel and interacting determinants of the health behaviors and the well-being
Table II. Interview overview and information for the participants in the study for understanding school health environments in Lao PDR, Mongolia, Nepal and Sri Lanka

<table>
<thead>
<tr>
<th>Interview number</th>
<th>Interviewees</th>
<th>Translation (T)/ Language used</th>
<th>School information</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Principal (male), Vice-principal (female), Health education teacher (female), Officer of the ministry of health (female), Officer of the health department (male)</td>
<td>Lao-English (T)</td>
<td>Secondary school (1st–7th year, 1540 students, 70 teachers)</td>
<td>Lao PDR</td>
</tr>
<tr>
<td>2</td>
<td>Principal (male), Vice-principal (male), Health education teacher (male), Officer of the ministry of health (female), Officer of the health department (male), Officer of the education department (male)</td>
<td>Lao-English (T)</td>
<td>Secondary school (1st–4th year, 517 students)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Principal (female), Vice-principal (female), Health education teacher (female), Officer of the ministry of health (female), Officer of the health department (male), Officer of the education department (male)</td>
<td>Lao-English (T)</td>
<td>Primary school (1st–5th year, 180 students, 13 teachers)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Principal (male), Vice-principal (female), Health education teacher (female), Officer of the ministry of health (female), Officer of the health department (male), Officer of the education department (male)</td>
<td>Lao-English (T)</td>
<td>Secondary school (1st–4th year, 134 students, 10 teachers)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Principal (male)</td>
<td>English</td>
<td>Higher secondary school (1st–12th year, 1275 students, 40 teachers)</td>
<td>Nepal</td>
</tr>
<tr>
<td>6</td>
<td>Principal (male), Health, Population, and Environment teacher (male)</td>
<td>Nepali-English (T)</td>
<td>Higher secondary school (ECD to 12th year, 750 students, 45 teachers)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Principal (female), Health, Population, and Environment teacher (female)</td>
<td>Nepali-Korean (T)</td>
<td>Higher secondary school (ECD to 12th year, 1,200 students, 100 teachers)</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Principal (male), Health, Population, and Environment teacher (male)</td>
<td>English</td>
<td>Secondary school (ECD to 10th year, 450 students, 30 teachers)</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Officer of the district education department (female)</td>
<td>Mongolian-Korean (T)</td>
<td>—</td>
<td>Mongolia</td>
</tr>
<tr>
<td>10</td>
<td>Officer of the district health department (female)</td>
<td>Mongolian-Korean (T)</td>
<td>—</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Principal (female), School doctor (female), Teacher (female), Officer of the district health department (female)</td>
<td>Mongolian-Korean (T)</td>
<td>1st–11th year, 1100 students</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Principal (male), Education manager (male), School doctor (female), Health teacher (female), Officer of the district health department (female)</td>
<td>Mongolian-Korean (T)</td>
<td>1st–11th year, 380 students, 20 teachers</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
of the school members, we conducted qualitative inquiries based on the social ecological model [10, 17]. A semi-structured interview guideline was developed and translated into the national language of each country. The interview questions explored common health problems among students, the cause of the problem as the interviewees perceived it, student coping strategies, school environments, school support systems, and barriers to implementation of health-related activities (Table I). The second author (E.Y.L.) conducted group or one-on-one interviews at each school and then observed the school environments including the buildings, grounds, toilets, water services and sewer system, canteen and school health services. We used a simple checklist during the observation and used the collected information for triangulating the contents of the interviews. The school personnel guided the interviewer around the school. Interpreters asked the questions in the language of each country and translated the responses into English or Korean. Before the interviews, the interpreters were informed of the background of the project, the protocol and the instructions of the interviews. The interviews lasted an average of 60 min and were audiotaped and transcribed. When the transcribed data were in a local language, they were translated into either Korean or English depending on translator availability. All the translated transcripts were reviewed by the interviewer for accuracy.

We developed a codebook as a first step in data analysis. A codebook is a guideline and a manual to code the text-based data [18]. It consists of a list of codes, which are a word or short phrase that assigns ‘a summative, salient, essence-capturing and/or evocative attribute for a portion of

<table>
<thead>
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<th>Table II. Continued</th>
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<tbody>
<tr>
<td>Interview number</td>
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<td>13</td>
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<tr>
<td>14</td>
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<td>15</td>
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<td>16</td>
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<td>17</td>
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</tbody>
</table>

ECD, early child development.
language-based' data [19]. According to our research questions and governing theoretical framework, we listed the codes and accompanying instructions on when to code and when not to code. Then two authors (S.P. and E.Y.L.) coded the textual data using the codebook and numerous discussion sessions led to agreement of the final coding.

A framework analysis was used for analyzing the data. This method summarizes and classifies the data using a thematic framework, which uses a chart with a matrix or table of main themes and subtopics for each theme [18]. The coded data were summarized into the matrix, which was developed based on the predefined topics of the research. The coders examined the patterns of the data and drafted the themes, which were grouped into individual, school and community level. Other authors reviewed the data and the themes were finalized. During this process, the qualitative data management program ATLAS.ti (version 6.0) was used.

**Results**

Two major topics were discussed through three one-on-one interviews and 14 group interviews with 58 participants in four countries. The following results revealed common themes. Major school health issues were revealed through questions 1 and 2. The reasons for these health issues were understood through questions 3–5 and described six common themes.

**Major school health issues**

Most of the interviewees in Lao PDR, Nepal and Sri Lanka mentioned that students who attend school regularly are relatively healthy and common health issues are related to seasonal colds, fever, coughs, stomachaches, headaches and menstrual cramps among girls. All the participating countries shared these common health issues.

According to what I have noticed about the students’ health, the common problems are colds, fever or getting a cough which lasts for 2–3 days... but there is no serious problem (Health education teacher in Lao PDR, interview 4).

Basically general problems are stomach ache, headache, gastric problems, diarrhea problems, and nausea. Nowadays, the incidence of diarrhea has decreased because children have become aware of personal hygiene (Principal in Nepal, interview 6).

Lots of students have gastritis. Most of the students say they feel that their chest hurts but when we asked them ‘what did you eat last night’ they say meat and bread. When they eat bread, they eat it with very spicy chili... (Principal in Sri Lanka, interview 16).

On the other hand, when we asked the same question on common student health issues to Mongolian principals and government officials, they showed some recent survey results that illustrate all the health issues among Mongolian students. Therefore, they were able to give a more accurate description of the health problems among the students such as tooth decay, poor eyesight and a recent hepatitis A outbreak in some schools.

The major problems among kids are tooth decay, tonsillitis, and poor eyesight. I think the most problematic health issue is tooth decay. A recent survey showed that 776 students had problems with their teeth in our school (School doctor in Mongolia, interview 11).

And we have some issues with infectious diseases... for example, jaundice... in other words, hepatitis A. Since Hepatitis A spreads so fast in schools, it is so dangerous. We administer vaccines for (Hepatitis) B and C but not A. So recently, we had some outbreaks in schools (Government personnel in district health department in Mongolia, interview 10).

There were clear differences in the depth of understanding of the student health issues among the participating countries. Mongolia and Sri Lanka...
had a national health surveillance system for
students, but only the Mongolian school staff
presented more detailed information on student
health. Sharing information with schools made this
difference. Thus, the Mongolian school staff was
able to identify health issues through sharing
the results from a student survey, while sharing
information on student health was limited in
Sri Lanka. In addition, the other two countries with-
out national level surveys regarded students as rela-
tively healthy and there were no urgent issues to deal
with.

Besides student health, the Mongolian and Sri
Lankan participants mentioned the increasing rate
of NCDs such as hypertension, diabetes and obesity
among adults including some teachers who suffer
from these chronic diseases.

Since people don’t move as much, we are
now experiencing more people with obesity
in this country. Urbanization contributes to
physical inactivity and stress... and also un-
healthy eating practices. And another reason
is poverty. A recent study said individual
behavioral factors account for 60% of
cardiovascular diseases, but I think non-
communicable disease is also associated
with social factors as well... such as poverty
and high unemployment rates (Government
personnel in district health department in
Mongolia, interview 10).

Reasons for the health problems among
students

When the interviewees were asked their thoughts on
the reasons for health problems among students,
most were viewed as due to economic hardship
(Table III). Specific quotes are as follows
under individual-, school- and neighborhood-level
factors.

Individual-level factors

Theme 1: Deficiency of personal resources to
cope with weather changes. The interviewees
mentioned that recent weather changes made
students more vulnerable to catching seasonal
colds and respiratory diseases. Moreover, this vul-
nerability is exacerbated by individual/family pov-
ety. As students in these four countries have to deal
with extreme weather conditions more often due to
recent unpredictable weather changes, students from
economically disadvantaged families are more
likely to suffer to a greater extent.

Climate change is the major cause of health
problems among students. Students don’t
have suitable clothes to cope with frequently
changing weather. As a result, they don’t
attend class due to colds, fever, or headache...
(Principal in Lao PDR, interview 1).

Theme 2: Lack of sufficient nutrition. The
second theme that emerged from the interviews
was insufficient nutrition among the students. Moreover, the parents’ lack of knowledge on
healthy diets usually affected their food choices
for their children. Therefore, teachers and principals
often find students eating unhealthy diets at home
and buying something unhygienic from the street
and school cafeterias.

... there are students who are from families
without enough money, so they have
food problems.... They don’t have enough
food to eat (Principal in Sri Lanka,
interview 15).

They put rice with water and eat, or some
people eat only rice with salt... so they
always have a stomachache. Because they
live in rural areas, they do not have enough
food, so they eat rice with salt only
(Vice-principal in Lao PDR, interview 3).

School-level factors

Theme 3. Shortage of physical resources in
schools. Many interviewees mentioned the lack
of physical resources in schools when describing
the school’s health environment and students’
health status. Due to the lack of school funding,
most of the participating schools pointed to a lack
of electricity, clean water, latrines and health
facilities. The author who conducted the interviews (E.Y.L.) confirmed some of the latrines lacked running water and that playgrounds were unevenly paved (data not presented).

I want to add something about the electricity. Like the other buildings, we still need electricity. When it rains and the sky turns dark, there is no light in the classroom where students are taking classes (Principal in Lao PDR, interview 3).

We do not have enough resources and the students are poor... and we are not getting enough support from our government. (. . . . .) Now we have been providing our children with filtered water for the last 78 years and every year the number of students has grown and we need a larger quantity of water. (. . . . .) I have a plan to give a water guard and water storage to provide water... but I am sorry because we don’t have enough money and resources to provide all these things (Principal in Nepal, interview 8).

The presented quotations above indicate that the lack of essential facilities, such as lighting and water purification systems, can significantly affect student health.

**Theme 4: Lack of proper health education.** Another theme that was shared by most of the interviewees was insufficient health education for students in the school curriculum. For these participating countries, the components of the health education curriculum were quite similar. For example, for secondary school students, health education classes consist of basic human anatomy and its related health functions, growth and development of humans, personal hygiene, nutrition, reproductive health and various life skills for personal care and health maintenance. Yet, in Nepal, Lao PDR and Sri Lanka, health education is often combined with other subjects (e.g. environment, population, physical education and science) as one course and the health subject is often not being taught to students. In Mongolia, they have regular health classes; however, they often mention a lack of educational resources, such as visual aids and training for teachers.

About the health subject we have a health subject there but, it’s not special... I mean not a separate course.... At secondary level, we have combined EPS... Environment Population and Health Science... and 10 years ago actually the health subject was compulsory... but nowadays it is not compulsory (Principal in Nepal, interview 5).

It would be very good if we had a teacher who could promote health to the students. We also want to have more teachers who have more knowledge about this field in order to distribute and teach the students, so the students can know more about health problems (Principal in Laos, interview 4).

We do have textbooks for health classes... but practically; it is difficult to conduct the class without proper visual aids. It would be nice if teachers could prepare for

<table>
<thead>
<tr>
<th>Level</th>
<th>Theme</th>
<th>Reasons for student health problems</th>
</tr>
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<tbody>
<tr>
<td>Individual-level</td>
<td>1</td>
<td>Deficiency of personal resources to cope with weather changes</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>Lack of sufficient nutrition</td>
</tr>
<tr>
<td>School-level</td>
<td>3</td>
<td>Shortage of physical resources in schools</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>Lack of proper health education</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Dependency on external organizations on school health initiatives</td>
</tr>
<tr>
<td>School- and Community-level</td>
<td>6</td>
<td>Insufficient medical services in schools and communities</td>
</tr>
</tbody>
</table>
themselves; however, it is not easy to do it with limited time and resources... (Teacher who is in charge of health class in Mongolia, interview 11).

**Theme 5. Dependency on external organizations for school health initiatives.** Because most of the participating schools did not have enough financial and personal resources for their schools’ own health initiatives, they often depend on external organizations, both domestic and international agencies. As it is the case that most of the external agencies have their own agenda and outcome goals, it is not easy to implement the health programs that are needed in the schools. Moreover, the participants described these external programs as not usually being ‘sustainable’.

...we were not able to run all these programs regularly and this is the problem because we have been dependent on the willingness of all the organizations. If they are satisfied and if they are willing to come to our school, they come and if they don’t, they don’t come to school. ... So I think to run this program continuously is the main problem (Principal in Nepal, interview 5).

**School- and community-level factors**

**Theme 6. Insufficient medical services in schools and communities.** The last common theme that emerged from the interviewees was insufficient medical services in schools and communities for students. Moreover, even when there are medical professionals in schools, professionals find it hard to provide adequate medical care because of the lack of funding for the maintenance of clinics, including medication and first aid resources. For instance, among the four countries interviewed, only Mongolia started to have school doctors working at school sites 5 years ago. However, the Mongolian school doctors that we interviewed still perceived a vast gap between the medical care needed for students and the care that they can provide. Except for Mongolia, the three other countries did not have any medical professionals in schools.

**Discussion**

To our knowledge, this is the first study to examine the school health environment using qualitative inquiry in LMICs in Asia. Previous studies have illustrated that schools are an important setting for improving student health behaviors [5]. As the vast majority of previous studies have been conducted in Western countries, relatively higher income countries, overnutrition- and obesity-related school health environments are the main foci of the literature [20]. Although a few participants in the present study did mention nutrition- and physical activity-related school environments, this issue was not so common as necessitating presentation as a separate theme (data not presented). Except for one study conducted in Lao PDR that examined the differences in HPS status in urban, semiurban and rural areas [21], there were no previous studies on school health environments in the participating countries.

Most of the interviewees in Lao PDR, Nepal and Sri Lanka mentioned that their students are healthy and do not have serious health problems except for some minor issues such as catching a seasonal cold, fever, stomachache or menstrual cramps among girls. On the other hand, Mongolian schools gave more detailed information on their students’ health status, explaining the most prevalent health issues among school-aged children in the country were based on a survey and a recent outbreak of infectious disease. Based on these differences, we learned that the level of school health awareness is different from country to country. These differences should be taken into account when designing future school health programs in these countries. For example, it is necessary for Lao PDR, Nepal and Sri Lanka to start with some school- or district-level surveys that would produce basic statistics on students’ health status and their key health behaviors.

As for the school health environment, most of the interviewees mentioned that the main determinant for the suboptimal school health environment is a lack of resources. Interviewees illustrated how individual-, school- and community-level poverty affected student health and why it is difficult to
provide desirable health environments when there is no sufficient governmental support. Given the low gross domestic product of the participating countries, it is understandable that the schools lack some of the essential components of healthy school environments. Thus, when asked what is most needed for their school health, most of the participants mentioned financial support for physical improvements, mainly buildings and facilities such as kitchens, labs, water and electricity. Some others mentioned health services, such as school doctors, health programs, curriculum, teaching materials and guidelines.

There is no doubt that physical and financial resources are important in providing good quality health education and medical services to students. However, we also know that the HPS concept, based on the Ottawa Charter for Health Promotion, has other fundamental elements than the physical environment [22]. Along with a school’s physical environment, the HPS concept emphasizes healthy school policies, a school’s social environment, individual health skills and action competencies, community links and health services in local and regional areas as key factors in addressing school health [23]. If we adopted this HPS concept in these four countries, it would be necessary to improve key stakeholder perceptions of holistic approaches in realizing HPS, not only for improving the physical environment but also for working on other essential elements as well.

Having proper health education that is composed of a regular curriculum and competent teachers who are well trained and equipped with effective educational aids is very important in improving students’ health skills and action competencies [24]. Health teachers and principals often mentioned that even though the schools do have health education classes, it is often skipped because teachers do not know how to teach the subject and do not have proper visual aids. Thus, in order to conduct effective health education, it is necessary to strengthen the teachers’ ability to deliver a health curriculum and to provide culturally acceptable educational aids [25].

Some studies have revealed the importance of the social environment and key stakeholder capacity development in HPS [25–28]. Yet most of the participants stressed physical resources or the lack of physical resources when they were asked about the school health environment. This has parallels with previous major international assistance programs that focus on providing physical resources to economically less-developed countries [29], but neglected capacity development. This gap was also shown in our interviews. Based on the interviews, it was clear that the overdependency on external monetary and materialistic support easily results in disconnectedness in implementing health programs in schools. As stated at the High Level Forum on Aid Effectiveness held in Busan in 2011, it is crucial to have key stakeholders’ ownership in achieving successful development programs [30]. Therefore, in future school health programs in LMICs, the focus needs to be on capacity development among key stakeholders and generation of proactive ownership among those working for student health [27].

It is well stated in the previous documents on HPS programs that understanding the context of interventions and the process of implementation is critical in order to develop interventions that are well connected to the system [16]. This means that we need to consider country-specific issues and the context of each setting. Through the interviews, we were able to learn that malnutrition issues were more salient among lower income countries such as Lao PDR and Nepal. In contrast, in Mongolia and Sri Lanka, weight gain and NCDs such as hypertension and stroke have started to become huge public health concerns, especially among adult populations. This was corroborated by recent evidence on obesity as an emerging public health issue in both countries [31, 32] and the international agencies’ emphasis on the global burden of NCDs particularly in LMICs [33, 34]. Therefore, it is imperative to consider country-specific issues when working with less-developing countries, and this country-specific approach will secure more desirable program outcomes.

With regard to the issues of nutrition, some interviewees mentioned that students do not have enough nutritious foods due to household poverty. This food
insufficiency can be easily translated into health problems such as various gastrointestinal disorders, which were also discussed by the participants as major health issues among students. In addition, the lack of proper knowledge on healthy eating practices coupled with suboptimal nutrition environments in schools and neighborhoods could exacerbate students’ health in the long term. Therefore, future school health programs in economically disadvantaged countries can consider providing nutritious food and nutrition education for better student health outcomes. Modification of school and neighborhood nutrition environments is an important area for future development.

In spite of this new understanding of the school health environment in four Asian countries, this paper has a few limitations. Because we had to use translators, we acknowledge that this might affect the data quality. We strived for compatible and competent translators across countries; yet, sometimes we had limited options as to who could translate their own language to either English or Korean. Second, we employed a purposeful sampling method, which lacks generalizability of the participating four countries. For administrative purposes, we selected one region in each country and focused on a few schools that were our potential project partners. Therefore, the readers of this article should consider the geographic specificity within the countries. Third, we acknowledge that cultural and political issues influenced the depth or the openness of responses in some countries, which can be regarded as a limitation of the study. However, we did our best to make these interviews and analyses more meaningful by selecting similar regions and schools in terms of location and type of school (i.e. public versus private), and the eagerness of school members in participating in this type of project. However, the readers should take into account the differences among the countries in political and cultural contexts. Fourth, in terms of the participants’ role in school health, they were not homogeneous groups of people from four countries due to the limited options that we had when we recruited interviewees. Fifth, although this study focused more on the general descriptions of school environment from key stakeholders, we attempted to discern differences in their views and perspectives on school health depending on their responsibilities and gender. However, we could not find any evident differences in their perspectives, possibility due to the lack of sufficient numbers for each participant group to permit comparison. In future research, a stratified sampling approach is needed to address this specific issue. Last, this study focused on adults’ perceptions of student health and the school environment. As students themselves are key stakeholders, future study is needed to understand their perceptions and experiences.

In conclusion, this study provides information on the multilevel and interacting determinants of health behaviors and the well being of school members in four mid- and low-income Asian countries and suggests personal and environmental leverage points for health promotion in schools. Because most of the previous literature on HPS was limited to schools in more affluent countries, the issues the schools are facing are different from the ones that the schools we studied are experiencing. For example, the lack of clean water and electricity in schools has not had inadequate coverage in the previous HPS literature. In spite of this different economic context, we believe that the basic concept of HPS should be applied when working with schools in LMICs. To develop school health programs in LMICs based on the HPS concept, it is crucial to raise school health awareness among school members and to develop school capacity to plan, implement and evaluate their own programs as well as to improve school physical environments. Based on these findings, we are in the process of implementing capacity development programs in one region in each of the four countries. We also hope to observe some diffusion of knowledge and practices among the people from these four countries through workshops and conferences to learn from each other.

Acknowledgements

The authors thank Dr Godwin Kodituwakku of the National Institute of Education in Sri Lanka for his
comments on the previous version of the manuscript. The authors also thank all the participants who shared their precious time to participate in this study.

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**Funding**

This work was supported by the Ministry of Education, Science and Technology of the Republic of Korea and the United Nations Office for South–South Cooperation of the United Nations Development Programme.

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**Conflict of interest statement**

None declared.

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