Adaptation of the school health index to assess the healthy school environment in Jordan

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تكييف مَنْسَب الصحة المدرسية بحيث يصلح لتقييم البيئة الصحية المدرسية في الأردن

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الخلاصة: عندما خططت وزارة التعليم لعقد حلقات عمل للارتقاء بوعي المدرسين حول البيئة الصحية المدرسية في المحافظات التي هي أقل تطوراً، أجرت دراسة سابقة وتالية للتدخل لتقييم تأثير هذه الحلقات في تغيير إدراك المدرسين. واستوفى 193 مدرساً في المدارس الابتدائية الاستبيان حول منسب الصحة المدرسية من إعداد مراكز مكافحة الأمراض والوقاية منها في أمريكا، وهو استبيان يستوفى ذاتياً، بعد تكييفه ليلائم هذه المواقع، باستخدام ست كراسات تدريبية من أصل ثماني كراسات. وقد ارتفع متوسط الأَحْرَاز بعد حلقات العمل في جميع النماذج ارتفاعاً يُعتدّ به إحصائياً، من 49.5٪ إلى 55.9٪ في ما يَخُصّ سياسات الصحة والسلامة البيئية؛ ومن 44.2٪ إلى 56.5٪ في ما يتعلق بالتعليم الصحي؛ ومن 40.3٪ إلى 52.9٪ في ما يتعلق بالتعليم البدني؛ ومن 51.3٪ إلى 59.2٪ في ما يَخُصّ خدمات التغذية؛ ومن 62.5٪ إلى 73.8٪ للخدمات الصحية؛ ومن 55.2٪ إلى 68.3٪ في ما يتعلق بمشاركة الأسرة والمجتمع. وقد أثبت الباحثان أن نموذج منسب الصحة المدرسية هذا، يمكن تطبيقه في البلدان النامية لرصد وتقييم المكونات البيئية في الصحة المدرسية.

ABSTRACT When the Jordan Ministry of Education planned workshops to raise teachers' awareness of the health environment in schools in underdeveloped governorates, a pre–post intervention study assessed the impact of these workshops in changing teachers' perceptions. A total of 193 teachers completed the self-administered Centers for Disease Control and Prevention school health index (SHI) for elementary schools, adapted for this setting using 6 of the 8 original modules. After the workshops, teachers' mean scores on all modules improved significantly, from 49.5% to 55.9% for health and safety/environment policies; 44.2% to 56.5% for health education; 40.3% to 52.9% for physical education; 51.3% to 59.2% for nutrition services; 62.5% to 73.8% for health services; and 55.2% to 68.3% for family/community involvement. The SHI model is implementable in a developing country setting to monitor and appraise the environmental components of school health.

Adaptation de l'indice de santé scolaire pour évaluer l'environnement scolaire sain en Jordanie

RÉSUMÉ Lorsque le Ministère de l'Éducation de Jordanie a programmé des séminaires-ateliers pour sensibiliser les enseignants à l'environnement sain dans les écoles des gouvernorats insuffisamment développés, une étude avant et après l'intervention a évalué l'impact de ces séminaires-ateliers sur l'évolution de la perception des enseignants. Au total, 193 enseignants ont rempli le questionnaire auto-administré sur l'indice de santé scolaire des *Centers for Disease Control and Prevention* pour les écoles élémentaires, adapté au contexte et composé de 6 modules sur les 8 d'origine. Après les séminaires-ateliers, les scores moyens des enseignants sur tous les modules ont été significativement améliorés, de 49,5 % à 55,9 % pour les politiques de santé, de sécurité ou d'environnement ; de 44,2 % à 56,5 % pour l'éducation sanitaire ; de 40.3 % à 52,9 % pour l'éducation physique ; de 51,3 % à 59,2 % pour les services de nutrition ; de 62,5 % à 73,8 % pour les services de santé ; de 55,2 % à 68,3 % pour l'engagement communautaire ou familial. Le modèle du questionnaire sur l'indice de santé scolaire est applicable dans un pays en développement mettant en œuvre le suivi et l'évaluation des composantes environnementales de la santé scolaire.

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Received: 26/07/09; accepted: 10/08/09

Introduction

In developed societies, policies and programmes concerning school health education and nutrition undergo periodic critical reviews [1,2]. The promotion of nutritional health among schoolchildren in developing countries, however, has only been superficially addressed. Fortunately, in recent years the question of nutrition and health of young children has attracted the attention of concerned international organizations and scientific researchers [3–5]. Based on the premise that children's eating and physical activity behaviours are influenced by the school environment, not just by factors such as playing fields and cafeterias, the Centers for Disease Control and Prevention (CDC) has developed the school health index (SHI) for elementary schools. The SHI tool is designed to help schools to identify strengths and weaknesses in their health and safety policies and programmes; to develop plans to improve student nutrition and health; and to engage teachers, parents, students and the extended community in health-enhancing behaviours [6].

Until recently in Jordan most health and nutrition research has focused on preschool children [7–11]. However, some programmes promoting nutrition for school-age children have begun. The school snack service programme was initiated by the government in 1999 to help combat poverty-linked malnutrition in young children in underdeveloped areas of the country. Based on reports of the positive impact of the school snack service [12], a dual-component research project for assessing students' nutritional health and studying the health environments of schools in underprivileged areas was initiated. The first phase was a nutritional survey [13] to substantiate the findings of the previous survey [12] and this was followed by a study to collect data on the school environment in Jordan in relation to health and nutrition. To launch the "healthy school environment" part of the project the Ministry of Education (MOE) conducted 2 series of nutrition and health educational workshops for science schoolteachers in underprivileged districts. To assess the impact of these workshops in changing teachers' perception of healthy schools, a pre–post-intervention approach was applied using an adapted version of the SHI for elementary schools to monitor changes in the school environment that could be attributed to increased teacher awareness.

Methods

The survey was conducted in 2 stages, pre- and post-workshop, with a 6-month period between the 2 workshop series (pre-determined by the MOE). This was designed to give the teachers sufficient time to implement their newly acquired health knowledge.

Site

The study sites were the elementary schools of 43 villages and hamlets, randomly selected with assistance from the Jordan general department of statistics. All these sites were eligible recipients of the school snack service and were located in 8 of the underdeveloped areas in Jordan. The beneficiary villages were clustered in districts of the governorates of Aqaba, Ma'an, Tafilah, Mafraq (North Badia district), Karak (Lajoon and Al-Saafi districts) and Balqa (Deir-Alla and South Shunah districts) [13].

Intervention

Each of the workshops was a 1-day course, focusing on the health impacts of children's exercising and eating habits. The format of the workshops was lectures, discussions and role play. Each participating teacher was nominated by the MOE to attend workshops. The workshops' team of instructors included volunteer paediatricians, academic nutritionists and physical fitness and public health experts.

Subjects

The authors identified potential respondents using the MOE list of teachers who intended to enrol in the workshop. All the teachers participating in workshops were requested to complete the questionnaire before and 6 months after attending the workshops. Only the teachers who signed informed consent for the survey were considered in the final analysis. In total, 202 teachers began the workshops and 193 finished the study, a completion rate of 95.5%.

Data collection

Instrument

The original SHI employs a simple questionnaire designed so that administrators, staff, parents and schoolchildren cooperate in creating healthier schools [6]. Anticipated outcomes of SHI-based surveys include improved student health, well-being and readiness to learn. The SHI for elementary schools includes 8 multi-item modules (domains) concerning a healthy school environment: school health and safety policies and environment; health education; physical education and other physical activity programmes; nutrition services; health services; counselling, psychological and social services; health promotion for staff; and family and community involvement. Implementation of each domain at a school or by a teacher is evaluated through multiple items that are scored from "fully in place" to "not in place". Once the survey is completed, a total percentage score for each module is recorded and respondents are instructed to use these scores in worksheets to determine recommendations for next steps. Recommendations are rated by administrators using 5 criteria: importance, cost, time needed to implement, commitment of the school community toward implementation, and feasibility. Within each module, the

priority of recommendations is then ranked using these scores.

To assure smooth implementation of the survey and to evaluate the suitability of the questions to the Jordanian context, the SHI questionnaire was tested in 5 rural schools in Irbid governorate 1 month prior to the beginning of the study. Several questions were found to have no relevance to poorer Jordanian students and their school set-ups. Those were mostly items on health promotion for staff and psychological counselling and social services. Another issue identified was that teachers were reluctant to answer the questionnaire, cautious of the consequences of "telling the truth". The pilot testing brought to light a need to adapt the SHI to suit the social and cultural circumstances of the schools and teachers. Adaptations included retaining only 6 of the 8 SHI modules, eliminating all inapplicable questions on certain items and translating the questionnaire into Arabic. Importance was also given to assuring teachers of the confidentiality of their responses and that SHI was not an instrument for auditing or punishing school staff who may not yet be implementing the strategies taught in the workshops.

Procedure

The first phase of data collection began in early 2003 by distributing the questionnaire to registered teachers in their schools of the study villages and hamlets at least 7 days prior to the first workshop. Short interviews were conducted with respondents to introduce the 2-page self-administered questionnaire and to deliver the consent form. Participants were asked to sign the form and to return it with the completed questionnaire just before the workshop. The questionnaire included 60 questions covering the 6 modules investigated, as detailed earlier.

Approximately 1 week later, the MOE launched the 1st round of health-oriented educational workshops, with the 2nd round scheduled to be held after 6 months in the same 8 areas. Just before the start of the workshops, another short meeting with individual participants was arranged to answer questions on any misunderstood or misinterpreted items of the questionnaire.

Data analysis

The data were structured and analysed in a longitudinal framework. A response of either satisfactory or acceptable was considered positive in the analyses; the proportion of positive responses represented the score for that item. The measured outcome was the change in perception among schoolteachers on scored variables describing the role of health and nutrition in the school setting. Within-module changes in views were evaluated by cross-tabulation of positive responses comparing pre- versus post-workshop scores.

Data analysis was conducted using *SPSS*, version 4. Microsoft *Excel* was used for data entry. Frequency tables for pre- post-intervention data were created, and data are presented as mean percentage scores. The focus of analysis was of the pre–post differences. For each module as well as for some module items, pre–post differences in implemented procedures were calculated and analysed using Pearson chi-squared and independent sample *t*-tests. In every analysis, differences were considered significant if the *P*-value was < 0.05.

Results

The distribution of respondents with complete data by district/governorate was as follows: Aqaba 5.9%, Ma'an 5.4%, Tafilah 19.8%, North Badia 22.3%, Karak 4.5% (excluding Al-Saafi), Deir-Alla 13.4%, South Shunah 14.9% and Ghore Al-Saafi 13.9%.

Positive teacher responses for the 6 modules of the adapted SHI before and after the educational intervention are shown in Tables 1–6, including Pearson chi-squared analysis results. For the majority of items, the baseline scores were lower than the corresponding final scores. In the majority of cases, teachers' responses to questions on the different modules' elements indicated general improvement in the school environmental conditions. Teachers' perceptions were reflected in the clear rise in the final scores of the elements compared with the corresponding baseline figures. This applied to the status of schools' infrastructure as well as to the other environment modules. School infrastructure had an initial score of 59.7% for water, 58.5% for sewage and 69.3% for waste disposal. In the final survey, scores on water and sewage systems remained unchanged compared with the initial scores, while waste disposal scores improved to 90.0%.

For all 6 modules there was a consistent trend of significant positive changes in final scores compared with the initial values ($P < 0.05$), with less gain in school health-related policies than the other modules (Table 7). Mean initial and final scores were: health and safety/environment policies (49.5% versus 55.9%); health education (44.2% versus 56.5%); physical education (40.3% versus 52.9%); nutrition services (51.3% versus 59.2%); health services (62.5% versus 73.8%); and family/community involvement (55.2% versus 68.3%).

Discussion

Following calls for continuation of the school snack service to improve nutrition in school-age children [12], this survey was carried out to report on the health-related school environment in deprived areas of Jordan. The survey found that neither of the basic infrastructure elements—water or sewage systems—were fully operational at a majority of schools at the onset of the study. Additionally, nearly all items of the 6 modules of school health were judged by teachers to have some degree of unsatisfactory performance or

Table 1 Frequency of teachers' positive responses on selected items of the adapted school health index, before and after the intervention: school health and safety policies and environment module

Item	% of respondents		*P*-value
	Baseline (*n* = 202)	Final (*n* = 193)	
10-minute break for eating school snack	77.7	87.6	0.0096
Handwash before meals encouraged by teachers	66.3	74.1	0.0905[a]
Committee oversees health programmes	79.1	81.3	0.5835[a]
Access to low-quality foods prohibited	49.0	60.1	0.0268
20-minute recess, with physical activity stimulation	43.1	49.2	0.2240[a]
Policies guiding major physical activity targets	39.1	43.1	0.4192[a]
Physical activity prevention prohibited as punishment	14.4	15.5	0.7592
Access to physical activity facilities outside school hours	11.9	12.0	0.9756[a]
Policies guiding nutrition goals	32.7	43.5	0.0270
Physical activity facilities availability	3.5	4.1	0.7550[a]

[a]*not significant.*

application. Deviations from the target of having every environmental health element "fully in place" were greater for some of the items/modules than in others. Results from the health education module indicated that curricula were failing to cover basic topics on physical activity, nutrition and first aid. At the same time, opportunities for further education of teachers about this and other modules were scarce. School nutrition services were too often left in the hands of unqualified personnel, and the teachers' endorsement of the school snack programme was not accompanied by changes in the system's management and operation. Students did not have sufficient time for physical activity, and safety standards were minimal.

Nevertheless, the survey found a consistent improvement between pre- and post-workshop scores on all module items, in addition to waste disposal systems. This progress may be attributed to multiple factors. A rise in health awareness encouraged

Table 2 Frequency of teachers' positive responses on selected items of the adapted school health index, before and after the intervention: health education module

Item	% of respondents		*P*-value
	Baseline (*n* = 202)	Final (*n* = 193)	
Access to valid health knowledge	65.8	78.0	0.0071
Advocacy for people and community	64.2	75.8	0.0120
Use of communication skills	61.1	72.5	0.0163
Focus on using choice-making skills	52.3	64.3	0.0157
Curriculum has lesson plans	51.5	64.4	0.0095
Instructions on fitness	51.0	62.0	0.0276
Media influence on analysis	48.2	59.3	0.0270
Charts describing scope and sequence	48.0	60.1	0.0159
Parents notified about student hygiene	46.7	60.7	0.0053
Curriculum present in a written form	38.6	54.5	0.0015
Students enjoy health education lessons	38.1	53.9	0.0016
Evaluating students on health education	30.6	44.1	0.0055
Addressing healthy skills and behaviours	28.7	43.0	0.0030
Instructors enrol in continuing education	21.8	38.3	0.0003
Curriculum covers basic nutrition	8.9	9.3	0.8900[a]
Environmental health, air/water	75.8	84.8	0.0249

[a]*not significant.*

Table 3 Frequency of teachers' positive responses on selected items of the adapted school health index, before and after the intervention: physical education module

Item	% of respondents		*P*-value
	Baseline (*n* = 202)	Final (*n* = 193)	
Students active in at least 50% of physical education classes	40.1	54.4	0.0044
Physical education lessons enjoyable	39.6	53.9	0.0044
Satisfactory teacher/student ratio	31.3	34.8	0.4596 [a]
Applying physical education sequential curriculum	27.2	43.0	0.0010
Lessons consider students with special needs	22.8	39.9	0.0003
Teaching fitness through health-related lessons	21.8	37.8	0.0005
Curriculum follows international standards	17.8	30.1	0.0041
Safety standards	15.8	31.1	0.0003
Teachers receive continuing education	15.8	32.1	0.0001
Physical education teaching by certified teachers	13.9	28.5	0.0004
Focus on basic motor skills	11.4	23.3	0.0017

[a] *not significant.*

Table 4 Frequency of teachers' positive responses on selected items of the adapted school health index, before and after the intervention: nutrition services module

Item	% of respondents		*P*-value
	Baseline (*n* = 202)	Final (*n* = 193)	
Ensuring actual consumption of school snack	58.3	67.4	0.0615 [a]
Clean, safe and pleasant cafeteria	54.5	65.8	0.0219
Appealing and nutritive foods	43.1	50.8	0.1253 [a]
Emergency preparedness (e.g. choking)	36.6	49.7	0.0086
Suitable facility for snack eating	28.6	34.8	0.1853 [a]
Outside venues offer appealing foods	23.3	37.8	0.0018
Service manager qualified and certified	15.8	29.0	0.0016
Tools applied promoting nutrition education	23.8	28.5	0.2877 [a]

[a] *not significant.*

Table 5 Frequency of teachers' positive responses on selected items of the adapted school health index, before and after the intervention: health services module

Item	% of respondents		*P*-value
	Baseline (*n* = 202)	Final (*n* = 193)	
Informing staff about students' medical status	63.9	74.6	0.0214
Identification and referral of unwell students	52.5	66.3	0.0053
Services provision partnership	47.0	61.1	0.0050
Healthy eating promotion methods	24.3	42.0	0.0002
Physical activity promotion methods	18.3	34.7	0.0002
Collaboration of health committee	53.6	65.3	0.0180

by the workshops may have rendered teachers more qualified to make objective judgements regarding the school health environment, may have motivated school administrators to work on improving school conditions and may have exerted an indirect influence on the surrounding community and encouraged students and their families to be more aware of health-related issues in schools. The improvement in pre- to post-intervention scores may be taken as evidence of effective awareness-raising about healthy schools, and this prompts a need for such campaigns to be included in the educational policy of developing countries. In addition, the results of this survey suggest that the

Table 6 Frequency of teachers' positive responses on selected items of the adapted school health index, before and after the intervention: family and community involvement module

Item	% of respondents		*P*-value
	Baseline (*n* = 202)	Final (*n* = 193)	
Teachers approve offering morning snack	46.2	**57.5**	0.0247
Educating families on physical activity and nutritional health	41.1	57.0	0.0016
Family/students have input into nutrition programmes	32.2	48.2	0.0012

Table 7 Comparison of teachers' mean percentages scores on the 6 modules of the adapted school health index before and after the intervention

Module	Mean (SD) % score		*P*-value[a]
	Baseline (*n* = 202)	Final (*n* = 193)	
Health and safety/environment policies	49.5 (23.5)	55.9 (16.4)	0.02
Health education	44.2 (30.7)	56.5 (29.5)	< 0.001
Physical education	40.3 (26.0)	52.9 (29.0)	< 0.001
Nutrition services	51.3 (18.4)	59.2 (19.2)	< 0.001
Health services	62.5 (29.0)	73.8 (26.9)	< 0.001
Family/community involvement	55.2 (37.8)	68.3 (35.6)	< 0.001

[a] *Independent sample* t-test.
SD = standard deviation

SHI may be valid when used in developing nations to monitor school health curricula and environment.

Currently government spending on education in the developing world tends to be directed toward the expansion of facilities, materials and training teachers in basic aspects of education, such as the use of blackboards and improvements in examinations. Although children in schools may be less healthy than their preschool counterparts [3] only limited attention is paid by the education community to health problems in school-age children. Schools' health curricula may focus on increasing students' theoretical knowledge about nutrition, but place less emphasis on influencing students' motivation, attitudes and specific eating behaviours [3–5].

Developing countries today must realize that children's nutritional health is crucial to sustainable development. Policies should be implemented to promote investment in health among schoolchildren and ensure that nutritional goals for school-aged children are met. The use of an SHI-based programme to appraise the elementary school health environments is likely to be cost-effective. The teacher's role in identifying priorities is of importance. Professional development in the area of childhood health and nutrition is needed, and would be an integral part of a programme that includes the use of the SHI. Developed countries are using the SHI track the links between behaviours and morbidity, such as the link between physical activity and overweight [14]. Stakeholders concerned with the welfare of developing nations are urged to study the SHI models of developed nations. Local researchers can develop and use a modified version of the SHI to collect data essential to the formation of children's health policy.

Acknowledgement

The authors wish to thank the Ministry of Education for funding this survey.

References

1. *Consultation on strategies for implementing comprehensive school health education/ promotion programs. Comprehensive school health education: suggested guidelines for action*. Copenhagen, World Health Organization 1992.
2. Graham V et al. 'Filling the gap'—children aged between four and six years: sources of nutrition information used by families and kindergarten teachers. *Australian Journal of Nutrition and Dietetics*, 2000, 57:90–94.
3. Del Rosso JM, Marek T. *Improving school performance in the developing world through better health and nutrition. Directions in development*. Washington DC, World Bank, 1996.

4. Drake LJ et al. School age children: their health and nutrition. *SCN News*, 2002, 25:4–30.
5. Keirle K, Thomas M. The influence of school health education programs on the knowledge and behavior of school children towards nutrition and health. *Research in Science and Technological Education*, 2000, 18:173–190.
6. *School health index for physical activity and healthy eating: a self-assessment and planning guide. Elementary school version.* Atlanta, Georgia, Centers for Disease Control and Prevention, 2000.
7. Hijazi S. *Child growth and nutrition in Jordan*. Amman, Jordan, Royal Scientific Society, 1977.
8. Hijazi S, Abulaban A, Waterlow JC. The duration for which breast-feeding is adequate. *Acta Paediatrica Scandinavica*, 1989, 78:23–28.
9. Hijazi S et al. *Health of Jordanian children. The national multipurpose study of preschool children in Jordan*. Amman, Jordan, Ministry of Social Development, 1987.
10. Khatib I, Hijazi S. *JUST-child growth percentiles: cross- sectional study of the declination of jordanian child growth curve and its association with domestic patterns of infant weaning*. Amman, Jordan, Jordan University of Science and Technology Deanship of Scientific Research, 1993.
11. Khatib IM, Hijazi SS, Aggett P. *A role for zinc-fortified weaning foods in prevention of early linear growth deficiency in Jordanian infants*. Amman, Jordan, Higher Council of Science and Technology, 1995.
12. Khatib IM. High prevalence of subclinical vitamin A deficiency in Jordan: a forgotten risk. *Food and Nutrition Bulletin*, 2002, 23(3 Suppl.):228–236.
13. Khatib IM, Hijazi SS. Micronutrient deficiencies among children may be endemic in underprivileged areas in Jordan. *Jordan Medical Journal*, 2009, 43(4):324–332.
14. Datar A, Sturm R. Physical education in elementary school and body mass index: evidence from the early childhood longitudinal study. *American Journal of Public Health*, 2004, 94:1501–1506.

Health-promoting school initiative

The health-promoting school initiative was implemented in 1994 in the Eastern Mediterranean Region and the initiative has been adopted by 13 of the 22 Member States: Bahrain, Egypt, Jordan, Lebanon, Libyan Arab Jamahiriya, Islamic Republic of Iran, Iraq, Oman, Saudi Arabia, Syrian Arab Republic, Tunisia, United Arab Emirates and Yemen. Generally, health-promoting schools are run by the ministry of health, in close collaboration with the ministry of education. The World Health Organization' Regional Office for the Eastern Mediterranean is currently conducting a review of health-promoting schools in countries of the Region to set up a regional database on existing health-promoting schools and initiatives.

Further information about health promoting schools can be found at: http://www.emro.who.int/hps/index.htm