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Developing a health-promoting school using Knowledge to Action framework

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Abstract:

BACKGROUND: There is a lack of organized effort in the arena of school health promotion, which has been recognized as an effective approach to combat the growing incidence of communicable and noncommunicable diseases. With this view, a study was conducted to develop comprehensive and replicable model for health promotion in schools.

MATERIALS AND METHODS: The Knowledge to Action (KTA) framework recognized by the World Health Organization as an implementational framework was used in an implementation study in a school of urban Jodhpur to assess the challenges and gaps associated with health promotion interventions in the school. Baseline regarding knowledge application and practices was gathered using interviews with school staff, parents, and group interaction with students. Knowledge synthesis was done by a thorough search of available literature and the gathered baseline. Resource mapping was carried out using checklists developed from knowledge synthesis. Tailor-made tools were constructed for knowledge implementation for each component of the action cycle. Knowledge of facts related to health behaviors among students was evaluated using pre- and postquestionnaires and practical application of knowledge was assessed using a checklist of 28 indicators on a 5-point Likert scale. Values of tests were gathered and compared with test values 3 and 6 months after the implementation of tailored interventions using descriptive and inferential statistics.

RESULTS: Increase in correct answers by students (42% to 96%) and average response for indicators on the Likert scale (3.23–4.86) was seen on repeated interventions over 6 months. Tobacco consumption by school staff reduced by 20% and an increase in willingness among teachers was observed on follow-up interviews.

CONCLUSION: The study thus developed a model for health promotion in a school with the help of the KTA framework using tailored interventions that could further be evolved in other setups based on local needs and available resources.

Keywords:

Health behavior, health promotion, Knowledge to Action, Knowledge to Action framework, school health

Introduction

The idea of health promotion in schools evolved in 1980s to combat the growing incidence of communicable and noncommunicable diseases. It has since been regularly advocated as an effective approach to promote health in schools. It emphasizes an approach in which the health education and promotion is supported by the

school environment and ethos as a whole by incorporation into the daily practices and core academic curriculum.^[1] The concept is based on the belief that a well-developed school health promotion program can effectively encourage children, who spend majority of their active time in schools, to adhere to health-enhancing behaviors and thus reduce health-compromising behaviors.^[2,3]

Although the concept of School Health Promotion has been documented time

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and again, and the demarcation between healthy and unhealthy practices are known to some extent, but there remains a lack of an organized effort for health promotion at schools.^[4,5] Thus, there is an urgent need of a comprehensive framework that is both replicable and modifiable in accordance with the distinct local and state health issues and can bring about an organized effort toward school health promotion.^[5]

There are many theories, models, and frameworks used in the field of knowledge translation among which, conceptual frameworks are preferred as the means of applying theory toward implementation efforts.^[6] Knowledge to Action Framework or the “KTA Framework” is one of the highly cited conceptual frameworks by the organizations worldwide. Studies have described the use of the framework in successful implementation studies across the world, in the fields of *curriculum designing and education* of stakeholders in academic settings,^[7,8] *health promotion* for women in maternal and child health clinics,^[9] and *health education* for hypertension for the general public, health professionals, and policy makers.^[10]

The KTA framework is based on the commonalities of over 30 planned *action theories* with the addition of *knowledge creation* component.^[11] The framework assumes a *systems perspective* and takes into account all the behaviors of a system as a whole in the context of its environment, i.e., it considers the behaviors and relationships among individual components as an environment rather than isolated entities.^[12] Thus, the framework positions knowledge producers and users within a system of knowledge that is responsive and adaptive, and thus makes the process of knowledge translation iterative and dynamic.^[11] Since the school health promotion framework also needs to be a replicable and dynamic model in its core essence, this study was designed to observe the practicality and success of designing a model for school health promotion on the lines of the KTA framework.

The study was conducted with the following objectives: developing a Model School Health Promoting Program using KTA Framework.

Materials and Methods

An implementation study was planned in a school of urban Jodhpur. For the purpose of this study, the KTA framework was used to assess the challenges, identify gaps, and address the problems associated with health promotion interventions at schools. Six components described in the World Health Organization (WHO) framework for the development of health-promoting schools,^[13] namely existing school health policies,

physical environment, social environment, community relationships, personal health skills, and health services, with their respective checkpoints were used as indicators to ensure sufficient and correct uptake of knowledge.

Development of tools

The process of development of tools for data collection or tailored interventions follows knowledge inquiry, knowledge synthesis, and tailoring to develop specific tools for each phase of the action cycle. Knowledge inquiry was made to gather basic information regarding the topic, using peer-reviewed articles,^[5,14,15] and WHO guidelines.^[13,16,17] Knowledge synthesis was done by studying other implementation studies across the globe to narrow down the specific interventions, considering the practical aspects and the local issues of concern.^[18-21]

Data collection and baseline were gathered using semi-structured questionnaires and separate interviews were conducted with school staff (peons, guards, maids/sweepers, and other clerical staff), teachers, parents, and management, while group interactive sessions were held to observe the perception among students in three separate groups (classes I to V, classes VI to VIII, and classes IX to XII). Resource mapping was done to map out local resources at school (water and sanitation facilities, first aid, fire extinguishers, and disaster preparedness) as well as the approach to nearby health-care facilities, accessibility to unhealthy food, and tobacco products near schools.

The knowledge synthesis phase was carried out using the baseline thus gathered and correlating with available literature.^[5,13-21] Finally, tailor-made tools were created for problem identification, adaptation, assessment of existing barriers, development of interventions, tools for monitoring, and outcome evaluation and to ensure sustainability. The tools were piloted and opinions were sought from experts in relevant fields. After appraisal to the school authorities, the tools were implemented on the ground.

Pre- and posttest questionnaires were developed to check an overall knowledge of facts related to general, hand and oral hygiene, dietary habits, healthy foods, harms of tobacco consumption and alcohol abuse, waste disposal, bullying, and environmental conservation, while a separate checklist of 28 indicators, developed using the WHO framework for developing health-promoting schools, was used in group interactions, to assess the practical application of such knowledge. Feedback from the class teachers of student groups involved was continually sought during the group interactions to score the behavior on a 5-point Likert scale.

The mean values from test questionnaires and checklists were analyzed using descriptive statistics and provided an insight regarding improvement in knowledge and practices of students, 3 months and 6 months after the interventions.

Results

While mapping the school, certain good practices as well gaps were observed [Table 1]. An open area in the school premises for physical activity and to serve as playground, dedicated room for physical education and Yoga sessions, RO fitted water coolers, provision of first aid kits, and dedicated room for nursing in case of any injury or illness were observed. Adequate natural sunlight and ventilation was found in all the classrooms, and those rooms that did not have sufficient ventilation were used as storerooms. Potted plants were placed throughout the school as a limited area did not allow for much grass and tree plantation. No nearby stalls or shops selling tobacco products were found within 500 m radius of the school.

Action phases

Problem identification

School health policies

Healthy dietary habits that were strictly followed in junior classes but not so in senior classes (VIII and above), neither was a clear demarcation between healthy and unhealthy foods seen during the group interaction.

First aid and fire extinguishers were present, but only a single teacher was relied on who knew how to administer first aid and use a fire extinguisher.

Regular reinforcement to curb the peer pressure or any influence for initiation of tobacco and other illicit substance abuse was remarkably done by the school staff in a holistic manner. Nevertheless, during the interaction with students, influence from the elder siblings and relatives was seen, and little knowledge about the harms from passive smoking were observed.

The teachers were willing to contribute to health promotion efforts but had busy daily schedules and insufficient time between regular academic curriculums.

Table 1: Mapping of available resources

Resource mapping			
Observations	Present/absent	Remarks	Suggestions/corrections done
Water facility	Present	✓ RO treatment done ✓ Adequately position in school × No formal maintenance schedule	Maintenance schedule prepared and pasted Explained to concerned staff to abide
Adequate lighting and ventilation	Present in all rooms		
Playground	Present	✓ In premises playground and dedicated area	
Canteen	Absent	× Nearby sweet shops and fast food shops found in abundance	Student counseling done regarding balanced diet
Points of gathering in case of emergency	Absent		Points of gathering and pathways leading to them marked in corridors Mock drills conducted to prepare for emergency situations
Fire extinguishers	Present	× Lack of knowledge among staff and teachers	Training conducted for staff and teachers
First aid kit	Present	× Lack of knowledge among staff and teachers	Training conducted for staff and teachers
Plantation	Present	✓ Potted plants well maintained in the school premises	
Washrooms	Present	✓ Adequately positioned and sufficient in number × No formal maintenance schedule	Maintenance schedule pasted and explained to concerned staff Posters showing hand washing methods, flushing reminders, and water conservation pasted
Dustbins		× Nonsegregation into wet and dry waste ✓ Collection and disposal into waste collection vehicle rather than open dumping	Separate green- and blue-colored dustbins placed and staff sensitized regarding segregation
Tobacco stalls		✓ Not found within 500 m radius of the school	
Nearby health facilities		✓ Within 400 m of the school premises	

RO=Reverse Osmosis Water Filter System

Although there was a separate period allotted to health promotional activities in the weekly curriculum, it was mostly taken up for regular teaching extra classes.

No evacuation plans were found in case of any emergency or natural disasters. Government health programs such as deworming and vaccinations were carried out by the school but received limited support from the parents due to taboos.

Physical environment of the school

No evidence of bullying was seen from group interactions, but few instances were reported by the peons and guards. Students were allowed to leave in a systematic manner to taxis or their parents after school closure to avoid traffic accidents.

Adequate sanitation and drinking water facilities were available considering the student numbers, but there was a lack of a proper maintenance schedule.

Waste disposal was done in single (noncolor-coded dustbin), was then gathered by the maids, and disposed of in the waste collection vehicle; nevertheless, the students were aware about the separate dry and wet waste disposal.

School's social environment

No harsh disciplinary methods were used and mental health was promoted with active participation in school and classroom activities. Parents' involvement was largely limited to school annual functions and parent-teacher meetings. The issue of parent awareness and curbing the myths regarding vaccinations and other school-based government programs remained largely unattended.

Community relationships

Community involvement including activities lining with local community needs and involvement of local stakeholders, such as health-care workers and leaders and NGOs remained a large lacuna that could be further explored for effective reinforcement.

Personal health skills

Students were given knowledge about physical activity, infections, sexual education, drug and tobacco abuse, and general and oral hygiene along with the regular studies relevant to their age, with no dedicated time slots or practical knowledge-based discussion.

Health services

School attempted to seek regular immunization for the students and annual health checkup camps, but there were no active efforts from the local health services to contribute toward the same.

Adaptation of knowledge to the local context

Further interactions were planned, which focused on knowledge about healthy and unhealthy food items available locally rather than the deep-fried and high-calorific options; parent counseling regarding tobacco cessation, substitution to *cloves*, *goond*, *saunf*, and avoidance of consumption in front of children at all costs including sending them to market for the purchase of tobacco products, etc.

Open gathering places and closest path leading to them in case of an earthquake was planned and pasted in the school corridors.

Assessment of the barriers to knowledge use

Local culture of high calorific (fried and fatty foods and sweets) was prevalent in family gatherings and in day to day meals in most of the joint families. *Meethi supari* is not considered harmful in even the most educated population in the locality and was offered during all social gatherings. Dismissive behavior toward cessation of *guthkha* and other chewable forms of tobacco was identified as one of the biggest barriers to knowledge uptake and use:

Parent's reply to tobacco cessation counseling:

"I have been eating since a very long time, and my fathers and brothers as well. Nothing happened to them, nor will anything happen to me. Yes, I will stop sending my child to bring the sachets for me, but I cannot guarantee that no one in my family will consume in front of him."

"I have a stressful business, guthkha is the only thing that helps me concentrate, it will be very difficult to let it go now. I am prepared to face any side effects, if it helps me do my business. We are sending our child to such a good school, I am sure, he will never learn this habit of mine."

Among the teaching staff, lack of time resource was a major barrier that made them reluctant to be involved in dedicated health promotional and reinforcement activities.

Selection, tailoring, and implementation of interventions

Taking into consideration, the available resources in terms of finances, manpower, and time, implementations tailored to the identified gaps were implemented. Interactive sessions with students were held that emphasized the importance of healthy foods that can be easily available at home and healthier food options that can be ordered at restaurants (salads, juices, etc.). Harms from active as well as passive smoking were explained and the refrain was reinforced.

A separate session was held with the parents (during parent-teacher's meeting) to motivate them

toward healthy food habits at home and quitting stop tobacco/alcohol consumption all together or atleast refrain from consumption whenever the children were around. Parents were also made aware about the potential drug abuse implications and signs to identify any initiation by their wards. Myths concerning deworming medication and vaccinations were busted.

Training regarding the use of first aid and fire extinguisher (including maintenance, storage, and application) was done for the staff and teachers. Health promotion materials were handed over to the teachers including activities that could involve students and parents, such as taking pictures while healthy cooking, gardening, and outdoor sports instead of mobile games; inviting parents to zero periods while holding debates and discussions once a week or during parent-teachers' meeting. This served the dual purpose of sustainability of a reserved time slot for health promotional activities as well reinforcement for parents and students, while not hindering the academic schedule.

A maintenance schedule was created and pasted on the walls of toilets and water coolers. The concerned cleaners, sweepers, and maids were educated regarding segregation of dry and wet waste and advised to follow the maintenance schedules. Along with this, posters showing proper handwashing methods, flushing reminders, water conservation, and waste disposal (wet and dry waste) were pasted in the washrooms and near all dustbins to guide students as well as staff.

A medical camp was organized and management was motivated to contact every 6 months for such the camps.

Monitoring knowledge use

A 3 month and a 6 month follow (along with a medical checkup and screening camp) were done to ensure reinforcement and check on knowledge uptake. Mock drills for evacuation and gathering to the safe area were also conducted during every visit to make everyone aware of the plans.

The management was constantly motivated to maintain a spreadsheet or a register enlisting all the health promotional activities during zero periods, including student and parent attendance; medical camps and the number of beneficiaries and details of the concerned health-care facility. The records maintained by the cooperative school management served as an essential monitoring tool for knowledge reinforcement.

Evaluation of outcomes

To evaluation the knowledge uptake and feasibility of the model thus built using the KTA framework, pre- and posttest questionnaires along with a checklist consisting of 28 indicators were used.

The percentage of correct answers on test questions increased from 42% (pretest) to 86% (3 months posttest) and maintained above 90% thereafter (6-month follow-up) [Table 2].

The checklist evaluated practices among the students on a 5-point Likert scale (with 1 = no awareness and 5 = completely aware) in the areas of hand hygiene, general hygiene, toilet etiquettes, open defecation and urination, healthy diet, harmful effects of drugs, tobacco and alcohol, alcohol and tobacco use at homes, water conservation, and benefits of keeping school and homes clean. Students' responses were graded from 1 to 5 on the basis of the percentage of students able to answer correctly to questions asked.

Other favorable outcomes observed were a decrease in tobacco consumption in 20% of the school staff (peons and maids). On follow-up interviews with the teaching staff, motivation toward health promotion efforts increased since "it was not increasing their workload or working hours".

Sustainability of knowledge use

The sustainability of the initiative relied largely on the fact that the school administration would consider regular health checkup camps and inclusion of health promotion activities as a unique selling point in favor of the school that along with routine curriculum, also made efforts toward building a supportive and nurturing healthy environment for its students.

As a result of regular camps and activities, students and parents could be constantly reminded and reinforced against straying off the healthy practices which would eventually become embedded in the school's daily curriculum and student's daily routine.

Discussion

With this study, an attempt was made at developing a replicable model that could be scaled up to other schools. The long-term sustainability depends largely on the belief that once health promotional activities are established in the core academic curriculum, the observed beneficial effects will be sufficient enough to trigger continuity. The mean score of the practical application of health-promoting habits in daily routine went up from as low as 1.5–4.5 regarding the cleanliness of toilets (Group A, Classes I–V), 2.17–4.83 (Group B, Classes VI–VIII), and 2.83–4.83 (Group C, Classes IX–XII). The practice of hand hygiene (2.67–5) and healthy diet (2.67–5) also improved considerably in Group A after repeated sensitization sessions. Practical knowledge on how to avoid influence from elder siblings and peer pressure, and harms resulting from tobacco use and passive

Table 2: The checklist comprising of 28 indicators showing knowledge and practices of three student groups in various areas

	Before HPS sensitization			3-month follow-up			6-month follow-up			
	Group A	Group B	Group C	Group A	Group B	Group C	Group A	Group B	Group C	
	Classes I-V	Classes VI-VIII	Classes IX-XII	Classes I-V	Classes VI-VIII	Classes IX-XII	Classes I-V	Classes VI-VIII	Classes IX-XII	
Hand hygiene										
Method	2	2	4	5	5	5	5	5	5	
Material	3	4	5	4	5	5	5	5	5	
When to wash	3	3	5	5	5	5	5	5	5	
Mean	2.67	3	4.67	4.67	5	5	5	5	5	
General hygiene										
Bathing	5	5	5	5	5	5	5	5	5	
Brushing	3	3	4	3	4	5	4	5	5	
Clean clothes	3	4	4	5	5	5	5	5	5	
Mean	3.67	4	4.33	4.33	4.67	5	4.67	5	5	
Cleanliness of toilets										
Etiquettes	1	2	3	4	4	5	4	5	5	
Soap/handwash use	2	4	4	5	5	5	5	5	5	
Toilet paper (wiping seat of public lavatory)	1	1	2	4	5	5	5	5	5	
Water spillage	1	1	2	3	4	4	4	4	4	
Foul smell	2	2	2	3	5	5	4	5	5	
Flushing	2	3	4	4	5	5	5	5	5	
Mean	1.5	2.17	2.83	3.83	4.67	4.83	4.5	4.83	4.83	
Open defecation/urination										
Toilets at home	5	5	5	5	5	5	5	5	5	
Urination when outside	3	3	4	5	5	5	5	5	5	
Mean	4	4	4.5	5	5	5	5	5	5	
Healthy diet										
Practical meaning	2	3	3	3	4	4	5	5	4	
Benefits	4	4	4	5	5	5	5	5	5	
Wasting food	2	3	3	4	5	5	5	5	5	
Mean	2.67	3.33	3.33	4	4.67	4.67	5	5	4.67	
Harms from drugs, tobacco, alcohol										
Taking stand against peer pressure	-	1	3	-	4	4	-	5	4	
Harms of use	-	4	4	-	5	5	-	5	5	
Counseling received		Specific counseling not received, informed simply in daily activities			-	5	5	-	5	5
Mean	-	2.5	3.5	-	4.67	4.67	-	5	4.67	
Water conservation										
Wastage of water	3	3	3	5	5	5	5	5	5	
Collection of water	3	3	3	4	5	5	4	5	5	
Mean	3	3	3	4.5	5	5	4.5	5	5	
Environment conservation										
Dustbin use, littering	4	4	4	5	5	5	5	5	5	
Plants conservation	4	3	4	5	5	5	5	5	5	
Road safety	4	4	4	4	5	5	4	5	5	
Plastic bags/polyethylene	2	4	4	5	5	5	5	5	5	
Mean	3.5	3.75	4	4.75	5	5	4.75	5	5	
Benefits of clean home and school										
Mental health	-	3	3	-	5	4	-	5	4	
Healthy environment	-	3	3	-	5	5	-	5	5	
Diseases	-	4	4	-	4	5	-	5	5	
Mean	-	3.33	3.33	-	4	5	-	5	4.67	

smoking went up from 2.5–5 in Group B, while only reaching 4.67 from 3.5 in adolescents in Group C.

Group B (Classes VI–VIII) showed the most promising results achieving a perfect score of 5 in almost all the

indicators. Upon six-month follow-up, it was observed that due to repeated reinforcements, there was a marked improvement in scores of all the indicators which shows the effectiveness of the framework used as well significance of repetitive sensitization. These findings were consistent with work done previously by Buddeberg-Fischer *et al.*^[22] and Haleem *et al.*^[23] Nevertheless, few areas were also identified where the results could not be achieved as expected even after 6 months, i.e., brushing habits (4), toilet etiquettes (4.5), and water conservation (4.5) in Group A and healthy diet (4.67), peer pressure (4), and influence from elder siblings (4) in Group C. These indicators provided an insight for further scope of improvement and areas where more focused interventions could be planned while scaling up to other schools.

This study also explored the roles of various stakeholders that have a significant impact on the success or failure of such initiatives. Wilful involvement of teachers and parents was found to be an important determinant to obtain beneficial outcomes.

Conclusion

For developing a model school health program, the KTA framework helped in developing tailored interventions for each component of the action cycle, while the individual components further provided feedback to the process of knowledge creation. This model can further be evolved based on the local needs and available resources.

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Conflicts of interest

There are no conflicts of interest.

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