School Health Nursing Based on Intersectoral Collaboration: A Proposal for Developing a Cost-Effective Model

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ABSTRACT

Purpose: Although the importance of school health services is stated in laws and regulations, the absence of regular, sustainable school health services has made it necessary to devise a new model for Turkey. With this project, creating a model to promote school health nursing students in all schools in Turkey it is intended to provide continuous school health services.

Materials and Methods: All the students (6–11 years) were included in the scope of this project (n = 1433). This project was conducted in an elementary school with a dense student population in an area with internal and external migration and low socioeconomic level. The duration of this project was from September 2016 to May 2019.

Results: With the school health nursing model based on intersectoral cooperation, the necessary nursing care was provided in the health office, in addition to students developing positive health behavior and health self-control (p < 0.001), being provided the opportunity to diagnose important health issues early, and gaining the awareness of being responsible for their health.

Conclusions: The use of this model of school health nursing services based on intersectoral cooperation in the provision of health services in schools will provide positive health outcomes. In addition, it is sustainable to use because it is cost-effective.

Keywords: nursing, school, intersectoral collaboration, cost effective model

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INTRODUCTION

The necessity of providing health services to students in addition to education is determined by law. In the Directive on the Establishment and Operation of Community Health Centers, school health services are considered the duties of community health centers (CHCs). School health services in Turkey are conducted based on the School Health Collaboration Protocol signed between the Republic of Turkey Ministry of Natural Education (MNE) and Ministry of Health (MH) on September 25, 2006. In Family Medicine Law, school health services were enacted by removing the phrase “pilot” with Decree Law No. 663 in 2011. The Family Medicine Regulation states that family physicians are responsible for the general health status of school-going children and are obliged to provide diagnosis and treatment services for health problems [1]. Today, the workload of family physicians is high; thus, it was posited that providing health protection and improvement services to school-going children would be unrealistic [2].

The World Health Organization (WHO) stated that one of its goals in Europe is “to ensure that young individuals are healthy and fulfill their roles in society in a healthy way by 2020.” This highlights the importance and necessity of school health services that protect and improve the health of children and young individuals (under 19 years) [3,4]. Increase in the productivity of students in society and the knowledge and skills acquired in school are directly proportional to the quality of this period and thus demonstrate the importance of having a healthy school life and eliminating health problems that cause learning barriers [5]. Turkey’s population is aging; however, its most recent young population ratio is high compared with that of other countries. The number of children aged less than 15 years constitutes 25% of the entire population [6]. Taking care of the physical, social and mental health of these generations that form the society of tomorrow today means ensuring a happy and healthy society. Notably, millions of children’s health needs cannot be fulfilled only in hospitals and practices. Therefore, there is a substantial need for school health services [7]. Considering this information, the most important aspects are as follows: school-going children undergo growth and development, the importance of early diagnosis and health education practices in this age group is critical and the first social life after the family is school life and being open to learning and education.

For many school-going children, school healthcare is the first and most accessible contact point with health care and has the potential to regularly reach most school-age children through preventive, curative, and supportive health interventions [8]. School-based health promotion programs are considered a cost-effective initiative for early diagnosis, reduction of chronic diseases throughout life and obesity prevention [9,10]. School health services should be considered a specialized field of health services conducted in the community and should be presented with a multi-sectoral approach [11]. In this context, the traditional school health model, the contemporary school health model [7], the comprehensive school health model [12], and the global school health model [7], are proposed. In these models, the health services to be provided in schools require multidisciplinary and intersectoral cooperation [13-19].

Although the importance of school health services is stated with laws and regulations, the absence of regular, sustainable school health services has made it necessary to devise a new model for Turkey. Additionally, when school opportunities are missed in childhood, compensating is difficult, and a model is necessary for school health services to use the country’s resources efficiently while improving the health of school-age children. This project presents a proposal for developing a school health nursing model according to the economic situation, culture, lifestyle, and health habits of Turkey. This model is formed with the participation of different sectors (e.g., MNE, MH, universities, university students and lecturers, nongovernmental organizations, health care professionals, primary school students, families, and teachers).

It may be possible to improve the health and quality of life of school-age children with school health services embedded in community-based child health services [11]. This project provides students continuous school health services by applying the roles and functions of school health nursing by evaluating the results and creating a model for generalizing school health nursing in all schools.

MATERIALS AND METHODS

Study design, type, population and sample

This project was conducted in an elementary school with considerable student population in the Turkey an area with internal and external migration and low socioeconomic level. Primary school students aged 6–11 years were examined in this project. All the students were included in the scope of the project (n = 1433). The consent of families and students to participate in school health services, their willingness, and students’ presence at the school during the project process were determined as the inclusion criteria. This project carried out between 2016 and 2019 is a cross-sectional, follow-up, and interventional type field study.
Statistical evaluation

In evaluating the data, we applied descriptive statistics (percentage, mean, and standard deviation), χ² analysis and the significance test of the difference between two spouses, the significance of the difference between the two means, the Cronbach’s alpha test, and one-way ANOVA to determine the effect of health education by using the SPSS 16 package program. The accepted significance level was p < 0.05.

Ethics committee approval and permissions

This study was approved by the institutional review board of Ege University Faculty of Nursing (EU) (Scientific Ethics Committee) (no. 2016–140). School children and their parents included in the study were asked to give informed consent.

INTERVENTION

Project Planning and Infrastructure Preparation

Project coordinator of EU, Faculty of Nursing, Department of Public Health Nursing, District Director of National Education, Head of CHC, met at regular intervals. As a result of this process, the parties of the relevant sectors in top management (Bornova District Directorate of National Education, EU Nursing Faculty) were determined, and a protocol was signed between the parties. All these preparations were completed, and an application was submitted to the Scientific Research Projects (SRP) Coordinator of the EU Rectorate. The application was approved and supported by the SRP (Project ID: 818).

By using some of the resources allocated from the project, a health office was established in the school with the appropriate physical environment (bright, quiet, and safe), and equipment for school health nursing services was provided. In addition, with professional support, a computer software program used to maintain school health records was purchased. The health office was inaugurated with a ceremony (April 28, 2017) where in the following individual participated: District Director of National Education, Director of the National Education Branch, Head of the Faculty of Nursing Public Health Nursing USA and Project Manager, Project Researchers and Nursing Faculty, and fourth grade students and their parents.

Training of the Project Team

All the researchers had a doctoral degree in public health nursing. In addition, two of the researchers were at the school before starting the eye screening and examination by the EU Hospital. They were trained for one day in the Eye Cornea-Oculoplasty Unit and participated in the applications. Additionally, in the Public Health Nursing Internship course, fourth grade (interns) nursing students in each group who were continuing their education and training were practically taught how to perform the physical examination of primary school students under the guidance of the instructors in the project, and each student received this examination in the health office. In addition, the lecturers who participated in the training transferred information to intern students in each group who would later participate in the screening, provided trainings for eye examinations and vision screening at the health office, and used a sample application. After these applications, students participated in screening and examinations under the guidance of instructors.

Determining the Health Education Needs of Primary School Students

Education requirements were determined according to the results obtained from school administrators, guidance teachers, classroom teachers, and students in line with the requirements: “Health Responsibility”; “Adequate and Balanced Nutrition”; “Sleep, Rest, and Exercise”; “Self-Efficacy”; “Social Support”; “Coping with Stress”; “Protection from Accidents and Safe School Environment”; and “Personal Hygiene.”

Determination of data collection tools

To collect the data, first, a student follow-up form was developed, and the purchased software program was used to record the information and ensure its continuity. Within the scope of the project, six data collection tools were used: a student monitoring form, a vision screening form, a feedback form for teachers’ vision screening, the health perception and health behavior scale in children, the health locus of control scale for children and the health office daily registration form.

RESULTS

The students were invited to the health office in groups of three, according to their order in the class list. Physical examinations were conducted by the internship students in the health office, and student follow-up forms were filled in and recorded on the computer. These processes were completed in 15–20 minutes for each student.

The names of the students whose physical examination was found to be problematic and the problem or problems detected were recorded. The classroom teachers were informed in writing and this was shared with the parents through the teachers. In addition to the physical examination, eye examinations were performed to determine eye health problems or visual defects of students and ensure that they receive care and treatment as soon as possible. School health nursing interventions
(education, counseling, referral, follow-up) were planned for the health problems diagnosed in students. Priority areas for diagnosed health problems were determined, and nursing interventions were implemented in these areas. Students with health problems discovered through physical examination were directed to their family physicians and those with oral and dental health problems were directed to the Oral and Dental Health Center in the Bornova and Mevlana neighborhoods, where students could be examined and treated for free by the CHC President. Students with problems discovered during the eye health screening were directed to an ophthalmologist. Students with psychological and social health problems discovered during the examination were directed to the teachers in the Psychological Counseling and Guidance Unit of the school.

A separate school health file was provided for each student and students’ data were recorded on forms and a computer. The data obtained from examining the students were collected under three main headings: physical examination data to diagnose health status and determine health risks, eye examination and screening results, and growth and development status (Body Mass Index). The data obtained were analyzed and published in Continuous Medical Education, Balıkesir Health Sciences Journals [20, 21].

The physical examinations performed to diagnose health conditions and determine health risks demonstrated that 5.8% of the students had a diagnosed disease, especially respiratory system, heart, and kidney diseases. In addition, high rates of respiratory system (51.9%) and oral–dental health problems (91.6%) as well as overweight and/or obesity (16.5%) were found. Additionally, as the age group and grade level of the children increased, the incidence of overweight/obesity increased [21]. In addition, psychosocial problems, such as a fear of the dark, insomnia, and nail–biting, were observed [20]. According to the results of the eye examination and screening the most common diagnoses were eyelash inflammation, strabismus, and inability to focus (2.2%). Refractive error was detected in 18.9% of the students. Feedback was obtained from 75.4% of the students who had a suspicion of refractive error in either eye, and 33.2% of these students went to a doctor for an examination. Notably, 42.6% of the students who received a physician’s examination received glasses, 10.9% were started on medication, and 3% received both medication and glasses. The result of the screening demonstrates that 56.4% of the students who had a suspicion of refractive error in either eye and received a physician’s examination were detected correctly. The results of similar studies worldwide demonstrated that the most common health problems in school children are nutritional disorders, dental caries, hygiene problems, and visual defects (22-29).

In addition, 1,383 students were provided nursing care services (emergency first aid, acute illness care, counseling/education, referral, and follow-up) in the health office. The students most frequently visited the health office because of falling and getting bumps (71.6%) and pain (8.2%), followed by epistaxis (2.8%), incision (2.8%), finger jamming (2.3%), and other similar problems (12.3%). In nursing practice, the most common incidences were cold application (57.8%), dressing (26.6%), health office observation/follow-up (9.3%), referral (1.5%), and other (bandage, height/weight measurement, physical examination, health education/counseling; 4.8%).

**Implementation Phase of the Training Program**

Producing a change in behavior is complex and multifaceted. One of the steps to change negative behavior to positive behaviors is to increase the level of knowledge [30]. For this purpose, a curriculum is given to students in the fall and spring of the academic year, and this occurred in the 2016–2019 academic year. The curriculum was administered to each student for one class session (40 minutes) with an interval of five weeks. Health trainings were conducted in the conference hall of the school in three classes (approximately 90 students) during the course hours suitable for all branches. Some branches (especially in the first years) were enrolled in one class of education.

Power Point (P-P) presentations were prepared by three researchers using plain language and examining them in line with the subject and several pictures. Methods such as P-P presentations, demonstrations, posters, animation displays, and question-and-answer and role-play techniques were used in the training program (Table 1).

Short films and animations on each subject were presented to reinforce the training provided after the presentation. The purpose of using visuals in the educational presentations was to facilitate learning and increase the retention of the material learned. The spot films, audio books, and Cinevision films listened to and watched by students were selected from the MNE Education Information Network and the MH websites [31, 32].

At the end of the lesson, four to five questions were prepared on the subject to determine the effectiveness of the education the students received and to attract their attention (e.g., when should you wash your hands? How should you brush your teeth? What are the characteristics of individuals who have a balanced, regular diet?), and an answer method was used. In some training, models (mouth tooth models) were used. First, the students were shown the techniques applied on a model (correct tooth brushing technique) and asked to demonstrate the training received on the mockup (correct tooth
brushing technique). In some training, it was first demonstrated by the researchers using role play and the demonstration method (hand washing) after the presentation, and the students were asked to repeat the action.

Table 1. Education program

<table>
<thead>
<tr>
<th>Session</th>
<th>Duration</th>
<th>Content</th>
<th>Process, Method, and Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st lesson</td>
<td>40 min.</td>
<td>1. Health responsibility</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Animation, cartoon film</td>
</tr>
<tr>
<td>2nd lesson</td>
<td>40 min.</td>
<td>2. Adequate, Balanced Nutrition</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Animation, cartoon film</td>
</tr>
<tr>
<td>3rd lesson</td>
<td>40 min.</td>
<td>3. Sleep, rest, and exercise</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Animation, cartoon film</td>
</tr>
<tr>
<td>4th lesson</td>
<td>40 min.</td>
<td>4. Self-efficacy</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Animation, cartoon film</td>
</tr>
<tr>
<td>5th lesson</td>
<td>40 min.</td>
<td>5. Social support</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Animation, cartoon film</td>
</tr>
<tr>
<td>6th lesson</td>
<td>40 min.</td>
<td>6. Stress and coping</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Animation, cartoon film</td>
</tr>
<tr>
<td>7th lesson</td>
<td>40 min.</td>
<td>7. Protection from accidents and a safe school environment</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Role-play technique *Demonstration *Animation, cartoon film</td>
</tr>
<tr>
<td>8th lesson</td>
<td>40 min.</td>
<td>8. Personal hygiene</td>
<td>*PowerPoint presentation *Q&amp;A *Discussion *Banner, poster *Role-play technique *Demonstration *Animation film</td>
</tr>
</tbody>
</table>

Before the health education programs were offered to all students, the health perception and health behavior scale and child health locus of control scale were applied as pretests to evaluate health perceptions and health behaviors. The sub dimension of the health perception and health behaviors scale, which includes the education subject, was applied directly before the implementation of each training subject (pretest) and four to five weeks after the training program (posttest). When all the trainings were complete, the children’s health locus of control scale was applied as a posttest. The presentation of health trainings included in the project as an initiative and the acquisition of pretest and posttest data were conducted under the guidance of intern students and
At the time of writing this article, there was a positive development in Turkey at the time of writing: the Official Gazette, on September 11, 2020, in issue number 31241, published a new government mandate, namely, a nurse/assistant nurse or emergency medical technician/technician must be present in boarding MNE institutions with 250 or more registered students [33]. A healthy and safe school environment should be established in cooperation with a school’s administration, teachers, staff, their students’ parents and guardians. Within the scope of MH I., II., and III, step health services and school health nursing services should cooperate. Preventive and health promotion services should be known as services that concern more than the health system, and measures should be implemented to increase the cooperation of other sectors [34]. It is an advantage for primary school students to receive an examination that detects health problems early, monitors their growth and development, and helps them avoid risky behavior. To ensure all these aspects are realized, health services should be provided in schools. In this context, these project’s results demonstrate that intersectoral cooperation is critical for Turkey in maintaining school health services.

Universities may support the provision of school health services and within this scope. In the nursing faculty, school health nursing services can be provided under the coordination of senior
students equipped with the knowledge and skills of school health nursing and academic staff working on this subject. In this process, the university was responsible for creating in innovative initiatives and research and development activities in the development and maintenance of school health services. In addition, schools can be an ideal education and application area for university students.

In this project, institutions affiliated with Ministry of Health also contributed significantly to the creation of the model. Parents of students found to be at risk in school health screenings (e.g., physical examination, vision, and oral-dental health) were informed by their teachers. It was directed to the specialist doctors in the steps to receive health services. In this context, oral and dental health centers, which are close to the school, were determined by the head of Community Health Center for students with dental health problems, where students and their families would not have difficulty with transportation, and students were examined for free. In this manner, students were treated in a short time, and the progression of health problems was prevented.

The MNE and District National Education Directorate are important pillars of the model. To implement the health education program planned by students, teachers, and the school administration, in line with the requirements, a physical environment was provided by the school administration, the appropriate hours were determined and the time was planned. The health education program offered within these facilities was effective in promoting students’ self-control and identifying health behaviors. The importance of school health nursing was also emphasized by school administrators who explained these results to the upper units and parents.

The school administration, teachers, parents, and especially students were highly satisfied with the nursing care services (emergency first aid, acute illness care, and referral) and the interventions applied to the students in the health office. Regarding the receivers of these services, the positive feedback received from the District Director of National Education, school administrators, teachers, parents, students, and individuals with whom the academic staff and students are in close contact revealed the need for health services provided in the health center established by the school nurse. The students were happy to find solutions for their health problems in the health office and to have a unit that could consult on this subject. Taking the responsibility of their health, students applied to the health office to determine their height and weight measurements and obtain information on their physical and psychosocial health conditions during frequent breaks. That there is a unit in the school that provides health care services to students, staff, and teachers regularly by health professionals has also improved the satisfaction of school administrators. With the health services provided in the health office, the responsibility of school administrators and teachers for health services decreased. Teachers, who previously had to conduct first-aid practices, received this service from the health office unit by health professionals, and developed a sense of trust in this service. For parents, the ability of their children to access professional health care at school has resulted in increased satisfaction and confidence.

Regarding the comprehensive school health nursing service, it is a joint product of the university, MNE, and MH services (Figure 1). Collaboration with these sectors is important in starting and maintaining school health nursing services. School health nursing services, conducted in cooperation between students, schools, families, society, and sectors have been effective in increasing students’ positive health behaviors and developing health responsibility. As a result of the success of the project, a new protocol was signed between Izmir Provincial Directorate of National Education and EU Nursing Faculty, the service was expanded, and the number of schools where the project will continue was increased from one to seven schools.

LIMITATIONS AND STRENGTHS OF THE STUDY

This project has certain limitations. Scans that could be performed to determine other health problems such as those related to hearing, parasites, and scoliosis could not be performed because of, for example, inadequacy of the physical conditions of the health office, shortage of material, intensive work schedules of lecturers, and decrease in the number of interns to one or two students per semester.

CONCLUSIONS

We demonstrated that the health risks of students in this project were high, and the sample size was large. We concluded that the planned health education program (school health nursing practices) provided by the nurse at the school was effective in promoting students’ positive health behavior and increasing health controls. In addition, with the school health nursing services model developed based on intersectoral collaboration, the health risks of students were identified early, referrals were made, and this model was effective in developing positive health behaviors and taking on health responsibilities.
Notably, nurses have a key role in providing adequate infrastructure, establishing, and expanding the health office in all schools, and making these services permanent by shifting school health services under the responsibility of the state. In keeping with this, they should be provided employment in all schools. An important step has been taken to ensure the employment of a nurse in each school in Turkey. Our project outputs set an example. We conclude that the development of information technologies that can be used in school health services, ensuring intersectoral cooperation to strengthen the communication between teachers and parents with the school health nurse and ensuring rapid and effective communication will be important initiatives for the development and dissemination of school health services. In this context, the use of this school health nursing services model based on intersectoral collaboration in ding health services in schools will result in positive health outcomes. In addition, it is sustainable to use because it is cost-effective. Additionally, school health offices have become a unique field of hands-on practice for students enrolled in the public health nursing course.

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**Conflicts of interest**

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