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Hygienic education and training — the main direction of the implementation of health-saving measures in educational organizations

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Abstract

Background. Hygienic education and the creation of conditions for motivating schoolchildren to health-saving behavior is the most important task of parents, teachers, the public, preventive medicine and the state.

Aim. Studying the advantages and disadvantages of educational technologies used in working with schoolchildren and their parents when conducting hygiene education in educational institutions.

Material and methods. The study consisted of four stages. At the first stage, a selective audit of information posted on 24 official websites of educational organizations in Kazan was carried out. At the second stage, 142 parents were surveyed. The third stage included work with 25 teachers in focus groups. At the fourth stage, a survey of 374 (192 girls and 182 boys) students in grades 7–10 was conducted. The results were processed using the methods of parametric and nonparametric statistics (mean value, error of the arithmetic mean, proportion of the feature, Kendal coefficient, χ^2 at a significance level of $\alpha \leq 0.05$).

Results. Most (22 out of 24 analyzed) websites of educational organizations did not contain information on student health protection. The survey results of 142 parents showed low interest in the work carried out at the school. Evaluation of leaflets on healthy eating allowed us to choose the two most useful and informative ones: “For a teenager about nutrition. Food for the mind” ($X_{av} = 9.14$ points) with consensus ($W = 0.744$; $\alpha = 0.0456$) and “Healthy food for schoolchildren” ($X_{av} = 9.03$ points; $W = 0.757$; $\alpha = 0.0398$). The study of educational technologies used by teachers to instill in students the basic principles of health saving showed that teachers do not always use active forms. The result of a survey of 374 students was the identified need to improve knowledge in matters of self-regulation of the psychological state.

Conclusion. The study of the advantages and disadvantages of educational technologies used in the conduct of hygienic education and training of schoolchildren and their parents in the conditions of educational organizations requires further improvement and wider use of active forms of education that meet the needs of students.

Keywords: hygienic education, health protection, schoolchildren, educational organizations.

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Background

Adverse changes in the health status of the younger generation require both preventive medicine specialists and society as a whole to search for and implement effective science-based health protection strategies, including in educational institutions [1–4]. While studying at school, teenagers not only develop as socially adapted individuals but also form the most important characteristic of a person, which ensures the implementation of all the others, namely, the attitude toward one’s own health or health protection [5–7].

Hygienists have always focused on the issues of hygienic education for children and adolescents,

both during the formation of school hygiene in the late XIX to early XX centuries, during the formation of the Soviet state, and in the so-called “era of the USSR” [1, 4, 8, 9]. This remains relevant today, especially given that during the COVID-19 pandemic, many educational institutions have discontinued homeroom sessions and parent-teacher meetings, with information about the health protection of children and adolescents is posted only on official websites [1]. However, the primary objectives of preventive activities are to promote sanitary and hygienic knowledge, provide hygienic education of the younger generation, and create conditions for the formation of commitment in

schoolchildren to a healthy lifestyle. At the same time, a lot depends on the forms, methods, and means of presenting the information [10–13].

Instilling a value-based attitude toward health and motivation for a healthy lifestyle in schoolchildren can be successfully implemented both during the educational process at school (in the lessons of Life Safety, Biology, Chemistry, Physical Education, and Homeroom Sessions), and during extracurricular hours, namely, extracurricular activities (trips to nature, joint trips to museums, cinema, theater). It is well known that creation of a culture of health in children and adolescents requires provision of a three-component structure of classes, including cognitive, emotional-evaluative, and behavioral components [14, 15].

Aims

The study aimed to analyze the advantages and disadvantages of educational technologies utilized in working with schoolchildren and their parents when conducting hygienic education in educational institutions. At the same time, the term “technology,” in relation to hygienic education, is used as a collective concept, including forms, methods, and means of teaching, due to which the most effective implementation of training is ensured.

Materials and methods of research

The study was conducted within educational institutions in Kazan and consisted of four stages, which took place simultaneously from September to December 2022. It was conducted as part of the project “Healthy Generation: A Systematic Approach to Preserving the Health of Children and Adolescents in General Education Organizations.” The project received approval from the local ethics committee of the Kazan State Medical University of the Ministry of Health of Russia (extract from protocol No. 6 dated June 21, 2022) and was descriptive in nature.

At the stage 1, a selective audit of 24 official websites (portal <https://edu.tatar.ru>) of educational institutions of the Novo-Savinovsky, Aviastroitelny, and Vakhitovsky districts of Kazan was performed to study the relevance and veracity of the information posted (useful for parents) regarding health protection of schoolchildren.

At the stage 2, an online questionnaire survey of 142 parents was conducted using a specially designed questionnaire (<https://forms.gle/epEydaPtQ7t4VDqk8>) to determine the need for additional information on health protection of children and adolescents and the form of presenting this information (including parent meetings, chats, websites, and extracurricular activities).

The questionnaire comprised 15 questions designed to assess how well the information presented on the school official website met their expectations. Additionally, parents were asked to evaluate the content of four preselected instruction booklets (posted on the official websites of the Republican Centers for Public Health and Medical Prophylaxis).

We purposefully chose a topic on healthy nutrition for schoolchildren and asked parents to rate the usefulness of this information for themselves and/or their children on a scale of one to ten points. The evaluation criteria included the following indicators:

- significance (providing information without delay and at the right time),
- relevance (correspondence of information to the interests of the group trained),
- completeness and complexity,
- veracity (providing real data based on an objective description of processes and phenomena),
- structuredness and accessibility of the information presented,
- persuasiveness of the material,
- emergence of motivation to follow the recommendations after viewing the instruction booklet, and
- practice orientability.

For each indicator assessed by parents (the minimum number of points on this scale was one, the maximum was ten), the concordance coefficient was calculated, and its statistical significance was assessed by determining the Kendall coefficient (W).

At the stage 3, a discussion was conducted with teachers to assess the need of additional information concerning the promotion of a healthy lifestyle among students. This discussion also covered various forms and methods of hygienic education of schoolchildren employed in homeroom sessions. Nine teachers of primary general education (level I of education) and 16 teachers of general and secondary general education (levels II and III of education) took part in this discussion, working within focus groups).

Furthermore, together with teachers, 16 animated videos created by employees of the Educational Center of the Federal Research Center for Nutrition and Biotechnology were viewed. These videos are posted in the public domain (https://www.youtube.com/playlist?list=PLjvkzgwO1c00-D_QIPdlp_1ZAwX-j2Q2), and the possibility of using them when conducting extracurricular activities with schoolchildren was considered.

The representation of the research focus group of teachers was relevant according to social and pedagogical criteria. This group consisted of teachers with more than 10 yr of experience and 5 yr or more of class supervision experience.

At the stage 4, the final stage, a Google survey (<https://forms.gle/NZ4ExRphuDa5XVh77>) was conducted among 374 schoolchildren (192 girls and 182 boys). The participants were students in grades 7–10. The primary objective of this survey is to identify current topics for discussion (during homeroom sessions or during extracurricular meetings), as well as to determine what additional information would be necessary and interesting from the standpoint of the children themselves. For this purpose, students were asked to complete a questionnaire consisting of only five questions, three of which were included in the “passport part” (age, gender, and educational institution), and two questions were aimed at identifying the need for information. Moreover, one of these questions presented answer options while also allowing respondents to enter their own variant. The last question was an “open” one, giving the opportunity to participants to independently indicate a topic of interest for discussion with friends (classmates).

Statistical calculations were carried out using the Microsoft Excel application package. The processing of research results included the use of parametric and non-parametric statistics methods, where the average values and the error of the arithmetic mean were calculated for quantitative variables, and the determination of the proportion of the characteristic (%) was used for attributive (relative) indicators. To assess the consistency of parents’ opinions, the concordance coefficient (Kendall’s consistency coefficient) was calculated for four instruction booklets according to nine criteria ($m = 9$). Fourteen parents ($n = 14$) were selected, whose responses during the assessment of the main indicators of the instruction booklets demonstrated a high degree of agreement (Kendall coefficient value $W > 0.7$). To assess the significance of the concordance coefficient obtained, the χ^2 criterion was calculated at a significance level of $\alpha \leq 0.05$.

Results and discussion

In a selective study of the official websites of 24 educational institutions in the Novo-Savinovsky, Aviastroitelny, and Vakhitovsky districts of Kazan, it was revealed that in almost all schools, specifically 22 out of 24 analyzed, tabs “Anti-terrorism,” “Anti-drug information,” and “Anti-corruption activities” were created, as well as “Preventing cold-related diseases,” which provides a “COVID-19 reminder” and information on flu vaccinations.

On only 16 websites of educational institutions, there was a tab “Working with parents,” which, as a rule, is filled with “random” information. Thus, on the website of one school in this section, there

was a report on the number of suicides in the Russian Federation in 2012, while another school’s website contained “Methodological recommendations for the prevention of entrapment” (approved by the Ministry of Education and Science of Russia on May 24, 2017 No. 07-2732, presenting 50 pages of typewritten text). However, there was no information that parents could use for the health protection and hygienic education of their children. Otherwise, if there was such information (links to guidelines on healthy nutrition and physical activity were revealed on the websites of four schools), when we tried to open the link and get acquainted with the information, we were convinced that the links did not work.

On the website of one gymnasium in the section “Working with parents,” an instruction booklet for parents was posted focused on providing psychological support to children. However, it is not indicated who created it (whether it was recommended by the Ministry of Health or Education for distribution in schools). Additionally, there was no imprint, and the approving authority was not indicated.

On the websites of 14 schools, the “Health and Safety” section mainly provides information on road safety and injury prevention. The “Meals” tab provides information in the form of official documents (order on catering, student meal schedule, etc.). Furthermore, there was a sample menu available; however, it was observed that the last update to this menu was on May 26, 2021.

One of the schools attached photographs of the interiors of the school cafe and created a “This is interesting” tab, which contained an article for parents, providing recommendations on proper nutrition for children. However, there were no approved methodological recommendations on a rational day regimen, lifestyle, and physical activity for children.

Thus, none of the 24 websites of Kazan schools provided relevant and reliable information on health protection of their pupils.

The stage 2 of our work was a sociological survey of parents. The questionnaires were distributed to 142 parents of students in grades 8–11 through chat rooms by form teachers. Responses from 87 (61.26%) parents were received, which indicated indirectly the low interest of parents in the work being performed at school.

When parents were asked whether they had explored the information available in the “Parents” or “Health and Safety” tabs on the school official website, 74 (85.06%) respondents indicated that they had never opened this tab on the school website, and the rest of respondents noted that the information posted did not satisfy them with either relevance or content.

Table 1. Comparative characteristics of expert assessments of instruction booklets (points) given by parents (n = 14) of school students in Kazan.

Criterion (m)	Instruction booklet number							
	No. 1 [16]		No. 2 [17]		No. 3 [18]		No. 4 [19]	
	X_{av}	W	X_{av}	W	X_{av}	W	X_{av}	W
1. Significance	9,7	0,758	9,6	0,746	9,4	0,717	9,3	0,769
2. Relevance	9,7	0,707	9,3	0,733	9,2	0,752	5,1	0,756
3. Completeness and complexity	8,9	0,719	8,2	0,728	8,7	0,740	6,1	0,724
4. Veracity	8,7	0,781	8,3	0,768	8,7	0,797	6,3	0,706
5. Structuredness of the information	8,9	0,784	7,5	0,801	9,1	0,786	7,5	0,804
6. Accessibility of the information presented	8,9	0,737	7,3	0,729	8,9	0,721	5,5	0,761
7. Persuasiveness of the material	9,1	0,753	6,3	0,797	9,3	0,811	5,1	0,745
8. Emergence of motivation to follow the recommendations	9,1	0,724	5,1	0,745	9,1	0,732	5,3	0,778
9. Practice orientability	9,3	0,735	7,1	0,768	8,9	0,754	4,3	0,801
Average score (X_{av})	9,14	0,744	7,63	0,757	9,03	0,757	6,06	0,760

When choosing issues related to strengthening and maintaining the health of children and questions that they would like to ask specialists during school meetings, parents noted the following as priorities that included:

- effective ways to combat digital (gadget) addiction,
- ways to know the results of examinations (laboratory and instrumental studies and examination by single-discipline experts) performed in schools for preventive examinations,
- methods to increase physical activity of children and adolescents,
- type of vitamins and the best time for a teenager to take them, and
- meals at school.

Analysis of the results and calculation of points given by parents when evaluating instruction booklets on healthy nutrition of schoolchildren showed that the average score (X_{av}) ranged from 5.81 to 8.23 points with a maximum possible score of ten points (Table 1).

According to the parents, the most useful and informative was the instruction booklet No. 1 “About nutrition for a teenager. Food for thought” with agreement among parents, as well as the instruction booklet No. 3 “Healthy nutrition for schoolchildren.” Thus, we can recommend these instruction booklets for use in preventive work with students and their parents and post them on the website of the educational organization.

However, given that 85.06% of parents (74 out of 87 participants who responded to the questionnaire at the stage 1 of this study) indicated that

they had never opened the “Parents” and “Health and Safety” tabs, passive placement of links to information resources, guidelines, and instruction booklets may not produce the desired result. To ensure these information materials are reviewed by parents of schoolchildren, teachers will need to perform additional work during parent meetings or in parent chat groups. Specifically, teachers should inform parents that such information is available on the school website, explain which section provides it, and emphasize why it is valuable, thus encouraging them to dedicate time and attention to this matter.

The next stage of our research was the study of the organization and methodology employed for conducting classes and extracurricular activities on hygienic training and instilling in students the basic principles of health protection. For this purpose, a discussion was held with 9 primary education teachers and 16 subject teachers in Chemistry, Physics, and Biology about the means, forms, and methods of hygienic education of schoolchildren, used by them during classes or during homeroom sessions.

During the discussion, we determined that the school curriculum includes subjects and individual classes, such as health lessons, designed to instill in students a commitment to health protection. To increase the educational effectiveness of the lesson, introducing children to the issue “being a healthy person is great,” forms of active learning are used, which are techniques of introspection (mutual surveillance), performing tasks in groups, pairs, exchanging opinions, discussing situations, and en-

couraging the students to freely express their ideas and standpoints.

Additionally, teachers noted the significant role and importance of extracurricular and out-of-school activities in the hygienic education and training of children, namely, conducting club activities, including the arrangement of health corners, excursions, academic competitions, and quizzes. Thus, in schools in Kazan, the plan for extracurricular educational activities includes events, such as a competition of posters, drawings, the publication of school magazines and newspapers, essays, and homeroom sessions on the topics such as, “I stand out for a healthy lifestyle,” “Pros and cons of drugs,” “Your health,” “Non-smoking generation,” “Life without drugs,” “Adolescent,” “The bluebird can be mine,” “My world and I,” “Health is the privilege of the wise,” “Boiling point,” “Box of goodness,” “Care,” and “Health is in your hands.”

During discussions on teaching aids, it was noted that all primary, general, and secondary general education teachers employ speech, printed, and visual means of hygienic education, both within main educational program and during extracurricular activities. Visual and verbal means of education are used less frequently in the classroom; two-thirds of teachers indicated the use of films and videos.

The use of active teaching methods was noted by just over half of the teachers participating in the survey, where five primary school teachers and nine teachers of secondary and high school indicated that they used real objects when explaining topics related to health protection issues. Additionally, only a third of teachers noted the use of practice-oriented teaching techniques (three and seven teachers, respectively).

During the discussion, teachers unanimously noted the positive, albeit small, experience of conducting conversations with the involvement of parents working in the healthcare system (psychologists, pediatricians), school doctors, and medical volunteers. It was proposed to revive the tradition of the school’s medical worker participating in hygiene training and homeroom sessions dedicated to the health-preserving behavior of students.

When evaluating the instruction booklets, the teachers agreed with the parents’ opinions but expressed additional wishes regarding content, filling, and graphic design:

- “too much information is presented in small print” and
- “there is no material on the negative aspect (consequences of unhealthy diet); therefore, there is no clear motivation to follow the recommendations.”

During discussions with teachers about the possibility of conducting extracurricular activities with students by watching animated videos created by employees of the Educational Center of the Federal Research Center for Nutrition and Biotechnology, with their preliminary or subsequent discussion, it was noted that their clear advantage is recommendations applicable in practice. Teachers also agreed that these videos can be used in working with teenagers of the older age group, who already know the basics of anatomy and physiology, since the videos contain terms, such as “calories,” “cholesterol,” “cardiovascular diseases,” and “ischemic disease.”

At the final stage, we analyzed the results of a Google survey of 374 students in grades 7–10. The survey involved answers to the question “Which of the proposed topics would be of interest to you personally” with 16 ready-made answer options and the opportunity to enter own variant. The answer options were as follows:

- “All about health: truth and myths,”
- “How to live longer and feel better,”
- “How to arrange properly a daily routine to maintain physical and psychological health,”
- “Truth and myths about healthy nutrition. Cheap, tasty, healthy,”
- “How to eat a healthy diet,”
- “Physical activity,”
- “Drinking regime,”
- “Prevention of obesity,”
- “How to achieve positive thinking,”
- “Stress resistance: how and when?,”
- “Necessary knowledge to assist in a critical situation (first aid),”
- “How to improve attentiveness and increase concentration,”
- “Prevention of myopia (visual impairment),”
- “How to achieve a beautiful figure,”
- “How to improve sleep,” and
- “Physical activity.”

The analysis showed that the majority of children (66.31%) consciously chose topics for discussion and proposed their own ones, namely, “How to live longer and feel better,” “How to do exercises correctly to built-up physique,” and “How to raise children correctly.”

Furthermore, it is worth noting that a significant proportion of schoolchildren wanted to receive additional information on the topic “Resistance to stress” (99 individuals, 26.47%; 63 of them were boys), as well as the topic “How to improve sleep” (129 individuals, 39.49%; 84 of them were girls).

When analyzing the students’ responses regarding the preferred methods and forms of work during class lessons or extracurricular hours (dis-

cussions, conversations, lectures, trainings, master classes, quests, including virtual ones), schoolchildren mostly (93.05%) chose active methods of obtaining information (the option “conversation” and “lecture” was chosen by only six and two students, respectively). Since the answer to this question implied the possibility of multiple choices, more than 1/4 of the schoolchildren chose the option “watching videos or television programs followed by discussion during class lessons” (27.54%).

There were schoolchildren (54 pupils, 14.44%) who did not give an answer or wrote “I don’t know,” “No difference,” or “No idea” to the open question “What topic(s) would be interesting for you to discuss together with friends and classmates?” that implied the ability to enter several options; while another 14 (3.74%) pupils indicated “None,” and one student even specified (author’s punctuation and spelling preserved): “*None! I don’t like healthy lifestyle, and I don’t even talk about it.*” The majority of schoolchildren indicated topics not related to a healthy lifestyle, such as “Plans for life,” “Everyday world that surrounds us,” “Finance,” “Politics,” “Sports,” “Economics,” “Creativity,” “Self-development,” “Our future,” “Visiting the shelter,” “Topics related to religion,” “Discussion of problems among teenagers,” and topics being completely different, for example, study, homework, discussion of a movie or book, news, and sports.

Conclusion

The study of educational technologies used by teachers to impart principles of health protection to students showed that teachers do not always use active forms in the learning process. Therefore, if speech, printed, and visual means of hygienic education are used by all teachers of primary, general, and secondary general education, both during classes in the main educational program and during extracurricular activities, then active teaching methods (classes using practical skills and using subjects required in real life) are used by slightly more than half of the teachers participating in the survey.

Work in focus groups with teachers of primary, general, and secondary education revealed the need to formulate a proposal to consolidate the efforts of the Ministry of Education, the Ministry of Health, and the Rospotrebnadzor Office in joint work of specialists from these ministries and departments with teachers and school medical workers to instill in students health-saving behavioral patterns.

The analysis of parents’ responses showed their need for additional information concerning the health protection of children and adolescents. While this work needs to be improved, since at this stage, low activity of parents was revealed (out of 142

people who were asked to take part in the survey, the answers were received only from 87 (61.26%) parents). It is noteworthy that simply posting passively the information about ways to protect and improve health (without additional explanatory work by teachers) on school websites will not induce a significant increase in the hygienic awareness of parents (85.06% of parents who took part in the survey noted that they had never opened tabs on the school website dedicated to student health protection).

The analysis of schoolchildren’s responses also revealed the need to provide additional information regarding the preservation and strengthening of their own health. Thus, according to the data from schoolchildren’s responses, it can be assumed that students experience a lack of knowledge on issues related to self-regulation of psychological state (stress resistance, adequate sleep). Students also show interest in a variety of general topics not related to health preservation, which they are ready to discuss with their peers both during classes and extracurricular activities, subject to the use of active learning technologies (forms and means).

Studying the advantages and disadvantages of educational technologies used in implementing hygienic education and training of schoolchildren and their parents in educational institutions requires further improvement and wider use of active forms of education that meet the needs of students.

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