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Application of MG Popular Science Animation in Primary and Secondary School Training on Children Drowning Accident

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Abstract

This study aims to thoroughly explore the application effect of MG popular-science animation in children's drowning accident emergency popular-science education. Considering the high-frequency occurrence of child drowning accidents and the limitations of traditional education methods, MG popular-science animation emerges as a potentially effective teaching means. In this research, 500 students from three schools, including Yongshun Blue Sky Primary School in Yongzhou, Yali Experimental Middle School in Changsha, and Shatang Primary School in Shuangfeng County, were involved. Through carrying out children's first-aid science popularization classes with MG science popularization animation as the main teaching means, students' learning situations were observed. The results indicate that MG animation can significantly enhance students' understanding and mastery of drowning accident emergency knowledge. It also boosts their operational skills remarkably. Therefore, MG animation holds important application value in drowning accident emergency science education in primary and secondary schools.

Keywords

Children; Drowning accidents; Popular science animation; Training; Effect

1. Introduction

Children are the hope of families and the future of nations. However, the drowning accident is like a high hanging sword, which always threatens the life safety of children, which highlights the urgency and necessity of carrying out drowning accident training in primary and secondary schools. From the perspective of children's own characteristics, primary and secondary school children have strong curiosity, active and limited cognition and judgment of danger. They tend to be attracted to the waters, but they have trouble recognizing the great dangers that lurk in them. For example, in the hot summer, children may go to rivers, ponds, and other dangerous waters to swim and play without considering whether they have the corresponding swimming ability and safety (Demchenko, N., 2023). This ignorance of the dangers makes them vulnerable to drowning, so it is vital to raise their awareness of safety and self-protection through training. The traditional popular science education method may be boring and difficult to understand, but MG popular science

animation is expected to become an effective teaching means with its vivid image and interesting characteristics. In this study, the application of MG popular science animation in the emergency popular science education of children drowning accident was studied by taking the children's first-aid popular science classroom of Sangzi Primary School in Shatang Township of Shuangfeng County as an example.

2. Current situation of child drowning accidents

In recent years, drowning accidents of children have occurred frequently. Every year, a large number of children lose their lives or suffer serious physical and psychological injuries due to drowning. Drowning not only poses a direct threat to children's life safety, but also may lead to a series of problems such as family breakdown and large consumption of social resources. The incidence of drowning accidents is relatively high in rural areas and areas around water, and the risk of drowning also increases significantly during peak swimming periods such as summer. Traditional drowning safety education methods mainly include classroom explanation, distribution of publicity materials, posters, and so on. However, these methods have many shortcomings in practical application (Pan, Y., 2024). Classroom explanation may be monotonous and difficult to arouse students' interest, resulting in students' inattention and poor absorption of knowledge. Although promotional materials and posters can convey some basic information, they lack dynamics and interactivity, which is difficult to impress primary and secondary school students with limited understanding ability.

3. Characteristics and training application mode of 3MG popular science animation

3.1 MG popular science animation features

3.1.1 Visual appeal

MG popular Science animation uses rich colors, vivid graphics, and smooth movements to quickly attract students' attention. Compared with static text and pictures, the dynamic presentation of animation is more in line with the visual perception characteristics of children and adolescents (Waring, S., 2024). For example, when presenting a drowning scene, students can better understand the danger of drowning through vivid character animation and water flow effects.

3.1.2 Vividness of content presentation

It can present abstract drowning principle, self-rescue method, and other knowledge in an intuitive way. For example, it simplifies complex knowledge by showing the changes of the human body's buoyancy in water, the struggle of drowning, and the correct posture of floating and calling for help. This kind of vivid content presentation helps students to better understand and remember the content of safety education and improve their coping ability in actual situations.

3.1.3 Fun and interactivity

MG popular science animation can incorporate interesting story elements and interactive links. For example, design a drowning rescue story with a small animal as the protagonist, so that students can learn relevant knowledge while enjoying the story. At the same time, some simple interactive questions can be added, such as choosing the right self-rescue method, so as to stimulate students' interest in participation and enhance their desire for active exploration of knowledge.

3.2 Training and application mode of MG popular science animation on drowning accidents in children

3.2.1 Application in classroom teaching

In the safety education class, teachers can play MG popular science animation as an important auxiliary tool for teaching. Before playing, ask some leading questions such as "Do you know what drowning is?" Ask students to watch the animation with questions. In the process of playing, the animation is paused timely, and the key knowledge points are explained and emphasized, such as the cause of drowning, danger signals, etc. After the broadcast, students can be organized to have a discussion and share their knowledge and feelings learned from the animation to further deepen their understanding of drowning accidents (Petrass, L. A., 2021).

3.2.2 Application of theme class meeting

The theme class meeting is an important platform for safety education. Around the theme of children drowning accidents, a class meeting with MG popular science animation as the core content can be specially arranged. Teachers can prepare relevant animation materials in advance and play them in class meetings. At the same time, students can be invited to role-play and imitate the drowning scene and rescue scene in the animation, so that students can experience and consolidate the knowledge they have learned in practice. In this way, animation content is combined with actual activities to improve the effectiveness of safety education.

3.2.3 Application in campus publicity

MG popular science animation will be broadcast on campus TV stations, electronic displays, and other campus media to expand the scope of publicity. It can be played on a loop during the time when students gather, such as recess and lunch time, so that more students can have access to drowning prevention knowledge (Ovca, A., 2019). In addition, the animation can also be made into a two-dimensional code and posted on the campus publicity board, the corridor of the teaching building and other places, so that students can use mobile devices to watch at any time, forming a comprehensive and continuous safety education atmosphere.

4. Children drowning accident MG popular science animation training practice

4.1 Research object

A total of 500 students from three schools, namely Yongshun Blue Sky Primary School in Yongzhou, Yali Experimental Middle School in Changsha, and Shatang Primary School in Shuangfeng County, ranging in age from 7 to 13 years old, including 282 males and 228 females, were studied.

4.2 Training methods

(1) MG popular science animation teaching. In the early stage of this training, MG popular science animation specifically aimed at children drowning accident emergency was produced. The animation content covers the causes of drowning, prone people, symptoms, first aid techniques, and first aid methods. In class, the animation is first played to guide students to watch it carefully. The vivid pictures, concise explanations, and interesting plots in the animation attract students' attention and let them have a preliminary intuitive understanding of drowning accident emergency knowledge.

(2) Theoretical explanation and interaction: After the animation is played, the theoretical explanation will be simple and profound according to the animation content. According to the knowledge points involved in the animation, such as the symptoms of different stages of drowning, the key steps of first aid, etc., the paper expounds in detail. At the same time, students are encouraged to ask questions, interact with students, answer their doubts in the process of watching animations and learning theories, and deepen students' understanding of knowledge.

(3) Operation demonstration and practice, organize the students to learn the operation of cardiopulmonary resuscitation, starting from the basic steps of "calling, calling, looking, touching", and gradually demonstrate the correct methods of cardiopulmonary resuscitation to the students, including the position, depth, frequency and operation points of artificial respiration. The students learned and practiced at the scene, and the volunteer team patiently guided and encouraged them to correct their wrong operations in time, so that the students could master the operation skills of cardiopulmonary resuscitation in practice.

4.3 Practice evaluation

Design a test paper that contains theoretical knowledge about drowning accidents, including drowning causes, symptoms, first aid principles, and theoretical points of cardiopulmonary resuscitation. The students were tested before and after teaching, and the difference in students' theoretical knowledge score was compared before and after teaching, so as to evaluate the influence of MG popular science animation on students' mastery of theoretical knowledge. After the students performed cardiopulmonary resuscitation operation practice, Associate Professor Zhang Xiaping and the volunteer team assessed the students according to the pre-established evaluation criteria for cardiopulmonary resuscitation operation skills. The evaluation criteria include the accuracy of the pressing position, whether the pressing depth is up to standard, whether the pressing frequency is appropriate, and whether the operation of artificial respiration is standardized. Students were scored according to their operational performance, with full marks of 100. The scores of students' operational skills in different stages were compared, and the effect of MG popular science animation teaching on the improvement of students' operational skills was analyzed.

4.4 Results

4.4.1 Theoretical mastery

Before teaching, the students had little knowledge of the theories related to drowning accidents, and the average score was 62.8 points. Most students only know that drowning is dangerous, but lack a deep understanding of the specific causes

of drowning, symptoms, and principles of first aid. For example, in terms of the causes of drowning, only a few students could name common causes such as swimming in unprotected waters and being unfamiliar with water. For the symptoms after drowning, many students can only be described as breathing difficulties, and the awareness rate of more detailed symptoms such as blue face and loss of consciousness is low. After teaching, the average score of students' theoretical knowledge improved significantly to 89.7 points. In terms of the causes of drowning, more than 90% of the students could accurately cite multiple common causes; As for the symptoms of drowning, most of the students can describe the symptoms in different stages in detail, such as the struggle and water choking in the early stage of drowning, to the confusion of consciousness, breathing and heartbeat arrest in the later stage. In terms of first aid principles, more than 80% of the students could correctly explain key points such as keeping the airway open and immediately performing CPR (Shan, X., 2021).

4.4.2 Operation skills

Before teaching, the students basically had not received the operation training of cardiopulmonary resuscitation, and the average score of operation skills was 54 points. Most of the students had serious errors in the position, depth and frequency of the compression and the operation of artificial respiration. For example, the press position is not accurate, and many students do not know that it should be in the middle of the line between the two nipples; The press depth is too shallow or too deep, some students only gently press, cannot reach the effective press depth, and some students press too much; During artificial respiration, the method of blowing is not correct, which cannot ensure that the gas can effectively enter the patient's lungs. After MG popular science animation teaching, theoretical explanation and practical operation training, the average score of students' operation skills increased to 83 points. In terms of press position, more than 69% of the students could accurately find the midpoint of the two-nipple connection to press; The press depth reached the standard rate of about 70%, and most students were able to press moderately according to the requirements; The accuracy of pressing frequency is also increased to more than 75%; The standard degree of artificial respiration operation has also been significantly improved, and more than 75% of students can correctly blow the operation to ensure that the gas can effectively enter the simulated patient's lungs.

5. The effect of 5 MG popular science animation on drowning training in primary and secondary schools

5.1 MG popular science animation to enhance students' interest in learning

The traditional popular science education of children drowning accident emergency is often based on text explanation and simple picture display, which is monotonous and difficult to attract students' attention. MG popular science animation, with its colorful pictures, vivid and interesting characters and creative plots, can greatly stimulate students' interest in learning. For example, in this teaching, cute animal images are designed in the animation to simulate the drowning scene. Students are attracted by these images and are more willing to take the initiative to understand the knowledge transmitted in the animation. The dynamic effects of the animation combined with sound effects enable students to maintain a high level of concentration during the viewing process. Compared with static teaching materials, MG popular science animation can transform abstract drowning accident emergency knowledge into intuitive visual and auditory information, which is easier for students to understand and remember. For example, through the simulation of the body reaction of the drowning person and the operation process of the emergency personnel in the animation, students can clearly see the actual performance of each step, rather than just relying on the text description to imagine.

5.2 MG popular science animation helps to understand theoretical knowledge

MG popular science animation can decompose and simplify complex theoretical knowledge related to drowning accidents, and present it to students in an easy-to-understand way. For example, when explaining the pathophysiological process of drowning, the animation shows the process of oxygen supply interruption and carbon dioxide accumulation in the body of drowning victims through graphic diagrams and animation demonstrations, so that students can intuitively understand why drowning leads to life danger, rather than just memorizing relevant concepts. The plot Settings in the animation can help students better understand the logical relationship between knowledge. For example, when introducing first aid methods, the animation will first show the possible consequences of wrong first aid methods, and then demonstrate the correct first aid steps, so that students can deeply understand the importance and principle of correct first aid methods through comparison, so as to better grasp the theoretical knowledge.

5.3 MG popular science animation to promote the mastery of operational skills

Operation skills such as cardiopulmonary resuscitation require students to accurately grasp the details of each movement. In traditional teaching, students often find it difficult to fully understand and imitate only the oral explanation and demonstration of teachers. MG popular science animation can show the operation steps from different angles and at different speeds, so that students can observe the operation process in an all-round way. For example, in the demonstration of cardiopulmonary resuscitation press action, the animation can show the correct position of the press from multiple angles such as front and side, and can also be played back through slow motion, so that students can clearly see the movements of the hand and the force of the body (Li, L., 2020). The animation can provide repeated viewing opportunities, and when students encounter problems in the actual operation process, they can review the operation demonstration in the animation at any time for self-correction. At the same time, the standard of operation demonstration in the animation is unified, which avoids the possible differences between different teacher demonstrations, and helps students to form accurate operation memory and muscle memory.

5.4 Further recommendations for the future

In the future, we can further enrich the cases in animation, increase the cases of drowning accidents of children in different scenes and different ages, so that students can better cope with various practical situations. At the same time, more interactive elements are incorporated into the animation, such as setting some simple question and answer sessions or small games, so that students can actively participate in the process of watching the animation and improve the learning effect (Barak, M., 2011). Although practical operation has been arranged in this teaching, the practice time can be appropriately increased to give students more opportunities for repeated practice. At the same time, more simulation props, such as simulated human models, are provided to make the students' operating environment closer to the real scene and improve their ability to cope with actual emergencies. MG popular science animation will be produced into CDS or online video resources, and distributed to parents of students, so that parents and children can watch and learn together, realize home-school cooperation, and jointly strengthen children drowning accident emergency popular science education. Parents can have interactive discussions with their children in daily life to consolidate the knowledge and skills their children have learned, but also to improve their own emergency awareness and ability.

6. Conclusion

All in all, through the implementation of emergency science popularization classes on child drowning accidents with MG science popularization animation as the main teaching method in three schools, namely Yongshun Blue Sky Primary School in Yongzhou, Yali Experimental Middle School in Changsha, and Shatang Primary School in Shuangfeng County, this study found that MG science popularization animation has a significant effect in improving students' theoretical knowledge and operational skills in dealing with drowning accidents. It can effectively stimulate students' interest in learning, help students better understand and master relevant knowledge, and promote the improvement of operational skills. In the future, drowning emergency science education in primary and secondary schools, the application of MG science animation should be further promoted and optimized, and children's self-rescue and mutual rescue ability should be continuously improved to ensure children's life safety. At the same time, it is also necessary to combine other teaching methods and means, such as field exercises, case analysis, etc., to build a more perfect children drowning accident emergency science education system.

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