

Educational Storytelling Implementation to Improve Knowledge of Packaged Sweetened Beverage Dangers for Early Childhood Kidney Health

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Abstract

The rising consumption of packaged sweetened beverages among children poses serious public health concerns, particularly for kidney health. These drinks, commonly containing high sugar levels, artificial colorings, and preservatives, are aggressively marketed to children through appealing packaging and strategic advertisement placements. Indonesia ranks third in Southeast Asia for sweetened beverage consumption, with 62% of children reportedly consuming them at least once a week. Despite the health risks, public awareness—especially among parents and educators—remains limited. This community service initiative aimed to educate kindergarten-aged children on the dangers of sugary packaged beverages through an interactive storytelling method at TK Aisyiyah 7, Magelang City. A total of 30 students participated in the activity, which involved pre- and post-assessment tests using an interactive game-based questionnaire consisting of three short, image-supported questions related to the educational material to assess students' knowledge before and after the intervention. An original storytelling session titled "The Adventure of the Brain, Kidney, and Bladder", the use of educational puppets and visuals, and a health-themed sing-along. Results showed high engagement from children and improved knowledge retention as evidenced by increased post-test scores. The initiative successfully demonstrated that storytelling is an effective medium for early health education, fostering awareness of kidney health and promoting healthier beverage choices among young children.

Keywords: Early Childhood, Kidney Health, Storytelling, Sugary Beverages

Abstrak

Meningkatnya konsumsi minuman berpemanis dalam kemasan pada anak-anak menjadi masalah kesehatan masyarakat, khususnya terkait kesehatan ginjal. Minuman tersebut umumnya mengandung kadar gula tinggi, pewarna buatan, dan bahan pengawet, serta dipasarkan secara agresif kepada anak-anak melalui kemasan yang menarik. Indonesia menempati peringkat ketiga di Asia Tenggara dalam konsumsi minuman berpemanis, dengan sekitar 62% anak mengonsumsinya setidaknya sekali dalam seminggu. Namun, kesadaran masyarakat, terutama orang tua dan pendidik, masih terbatas. Kegiatan pengabdian kepada masyarakat ini bertujuan untuk meningkatkan pengetahuan anak usia taman kanak-kanak mengenai bahaya minuman berpemanis melalui metode storytelling interaktif di TK Aisyiyah 7 Kota Magelang. Sebanyak 30 siswa berpartisipasi dalam kegiatan ini. Evaluasi dilakukan menggunakan pre-test dan post-test berupa kuesioner berbasis permainan interaktif yang terdiri dari tiga pertanyaan singkat disertai gambar. Kegiatan edukasi meliputi sesi storytelling berjudul "Petualangan Otak, Ginjal, dan Kandung Kemih", penggunaan media visual dan boneka edukatif, serta kegiatan bernyanyi bertema kesehatan. Hasil kegiatan menunjukkan keterlibatan siswa yang tinggi dan peningkatan pengetahuan berdasarkan skor post-test. Metode storytelling terbukti efektif sebagai media edukasi kesehatan sejak dini dalam meningkatkan kesadaran kesehatan ginjal dan mendorong pilihan minuman yang lebih sehat pada anak usia dini.

Kata kunci: Anak Usia Dini, Kesehatan Ginjal, Storytelling, Minuman Berpemanis

A. INTRODUCTION

The consumption of packaged sweetened beverages among children has risen significantly, driven by the widespread availability of artificially sweetened drinks in attractive packaging and aggressive marketing targeting children. Packaged sugary drinks such as sodas, bottled juices, and ready-to-drink teas contain high sugar levels, artificial coloring, and preservatives. These substances place excessive strain on children's developing kidneys and pose risks to other organ systems (Large et al., 2023)

Indonesia ranks third in Southeast Asia for sweetened beverage consumption (20.23 liters/person/year), with 62% of children consuming these drinks at least once weekly (Ministry of Health, 2024). Sweetened drink advertisements are extensively broadcasted across four private television stations, with peak advertising occurring during weekends (Saturday-Sunday) between 06.00 am until 09.00 pm coinciding with children's programming. Notably, many advertisements deliberately target children through appealing cartoon characters and engaging visuals (Relmbruss Biljerss Fanda, 2024). This marketing environment significantly increases children's attraction to packaged sweetened beverages, which may lead to detrimental health effects with chronic consumption.

The results of interview with the principal and teachers at Aisyiyah 7 Kindergarten in Magelang City revealed that many students rarely drank plain water and more frequently brought packaged sweet beverages from home. This finding persists despite the school's provision of drinking water dispensers to encourage adequate mineral water consumption during school hours.

Most packaged drinks contain high levels of added sugar, which, if consumed excessively, can lead to health problems in children such as obesity, diabetes mellitus, and tooth decay. The caffeine content in energy drinks can also trigger high blood pressure, sleep disturbances, and anxiety. In addition, the use of preservatives and synthetic colorings may pose long-term health risks, including impaired liver and kidney function (G.S et al., 2022). The liver and kidneys are the two organs most affected by the health risks of packaged drinks. Consumption of these drinks can cause inflammation of liver cells, indicated by yellow discoloration of the liver, and can also damage the kidneys through inflammation of the glomerular cells. Kidney damage may result in reduced kidney function. The kidneys serve to filter the blood and regulate the body's fluid balance (Salsabila S. Dhiya et al., 2023). Excessive consumption of packaged drinks can also lead to the accumulation of toxins in the body due to additives such as preservatives and synthetic colorings. Preservatives, such as sodium benzoate or potassium sorbate, are commonly used to extend shelf life, but if consumed in large amounts, they can cause side effects including allergies, digestive disorders, and even cancer risk. Synthetic colorings, while making drinks appear more appealing, also pose potential health hazards—particularly for children, who are more vulnerable to their adverse effects (Y. Wu et al., 2023).

This situation requires urgent attention as young children, particularly kindergarten-aged children, remain highly vulnerable to the adverse effects of consuming packaged beverages containing high sugar, artificial coloring, and preservatives. Excessive intake of

these chemically-laden, sugar-rich drinks imposes additional strain on children's developing kidneys (Heo et al., 2024). Kidney health constitutes a critical yet frequently overlooked aspect of child development.

During kindergarten age, children are in a critical period of growth and development, where every habit they form will impact their long-term health (Cha & Kim, 2023). Public understanding, especially among parents and teachers, regarding the negative effects of consuming packaged sweetened beverages remains limited, leading to frequent consumption. Children are often influenced by the habits of adults around them—whether parents, teachers, or peers—without realizing the long-term health risks posed by such unhealthy behaviors. Therefore, children also need to be equipped with knowledge about the dangers of consuming packaged sweet drinks.

It is crucial to implement concrete interventions early on. Kindergarten, as a place for shaping children's character and habits, should pioneer the adoption of healthy lifestyles. Understanding the risks of consuming packaged foods and drinks can help children recognize the dangers of sweetened beverages and improve their ability to choose healthier drink options, even without supervision from parents or teachers.

Educating children about the dangers of packaged sweetened beverages can be done through effective and engaging approaches, ensuring both children and teachers grasp the importance of early kidney health protection. One effective method for health promotion is storytelling. The storytelling method is an effective approach for developing children's language skills, particularly listening comprehension and speaking abilities. Consistent with this, the application of storytelling can enhance both linguistic development and moral education in children. As a developmentally appropriate practice, storytelling aligns perfectly with the cognitive and affective needs of preschool-aged children (Dwi Elka Fitri et al., 2023). This method has been proven to enhance children's comprehension and retention of messages because it is interactive, imaginative, and enjoyable (Shruti et al., 2021). Storytelling makes information more accessible to children by incorporating visual and emotional elements that capture their attention. By using storytelling for health education—such as teaching the risks of packaged drinks in kindergartens—the impact can be greater, as children more easily remember and emulate the stories they hear (Young Academics, 2022).

Storytelling has been a fundamental part of human culture for centuries, serving as a powerful tool for education, entertainment, and moral development. In early childhood education, storytelling plays a crucial role in fostering cognitive, linguistic, emotional, and social growth. Research indicates that storytelling enhances language acquisition, stimulates

imagination, and strengthens memory retention in young children (Noddy by Elizabeth, 2021). Emotionally, storytelling helps children develop empathy and emotional intelligence. By relating to characters in different situations, children learn to recognize and articulate their own feelings while understanding the perspectives of others. Moral lessons embedded in fables and cultural stories also teach values such as kindness, honesty, and resilience (Raising Children Network, 2023).

The implementation of this community service initiative is expected to enhance the knowledge and understanding of early childhood students about the dangers of excessive consumption of packaged sweetened beverages for kidney health. This, in turn, will help foster health-conscious behaviors in children, encouraging them to take better care of their kidney health, especially to Childhood Student in TK Aisyiyah 7 Kota Magelang.

B. METHODS

This activity is expected to serve as an educational effort to prevent kidney health problems in children as early as possible by promoting a healthy lifestyle through raising awareness about the dangers of excessive consumption of sugary packaged drinks. It aims to change the knowledge of young children toward reducing their intake of such drinks for the sake of kidney health. The target of this activity was carried out at TK Aisyiyah 7 in Magelang City, with a total of 30 kindergarten students (early childhood) aged between 4-5 years as participants.

During the preparation stage, the community service team coordinated with relevant parties to request permission and approval for the implementation of the educational activity. The team then collaborated with the school to determine the target audience, time, and location for the activity.

The team prepared educational materials in the form of a storytelling fairy tale titled "*The Adventure of the Brain, Kidney, and Bladder*". The team also prepared media and teaching aids in the form of organ-shaped puppets representing the brain, kidney, and bladder.

The implementation stage began with a pre-test consisting of three questions to assess children's knowledge about the dangers of sugary packaged drinks. This was followed by a storytelling session to narrate the fairy tale "*The Adventure of the Brain, Kidney, and Bladder*," performed by three members of the team acting as the Brain, Kidney, and Bladder.

The storytelling was accompanied by music and engaging background visuals to capture the children's attention. This was followed by material delivery using PowerPoint slides, and then the children sang a song titled *"I Love My Kidneys."*

The evaluation stage was conducted through a post-test using an interactive game-based questionnaire consisting of three short, image-supported questions related to the educational material. Pretest and posttest are conducted to evaluate the children's understanding of the dangers of sugary packaged drinks on kidney health and to evaluate the effectiveness of the educational material delivered.

C. RESULTS

The community service team coordinated with the Principal and Teachers of TK Aisyiyah 7, Magelang City by submitting a proposal and a permission letter for the implementation of the community service activity. The team also explained the rundown of the activity so that the teachers could prepare the time and venue according to the children's break schedule.

The activity was carried out on Monday, May 26, 2025, in Class A1 of TK Aisyiyah 7, Magelang City, with participation from 30 students and 3 teachers. The community service team involved 2 lecturers from Poltekkes Kemenkes Semarang and 5 nursing students from the Magelang Campus.

The activity began with an introduction and a pre-test in the form of a game consisting of 3 questions about the dangers of sugary packaged drinks for kidney health. Next, the team delivered a storytelling session titled *"The Adventure of the Brain, Kidney, and Bladder"*, using hand puppets shaped like organs as visual aids for the Brain, Kidney, and Bladder characters. The storytelling session was exciting and lasted for 20 minutes. This is in line with the theory which states that Storytelling greatly benefits children's minds by sparking their imagination (Rahiem, 2021). As kids hear stories, they picture characters, places, and events, boosting creative thinking (Rojabi et al., n.d.)

During the storytelling session, the children were very enthusiastic and paid close attention to the storyline presented by the three characters. The story introduced the three organs and their functions, explained the problems the kidneys face when children frequently consume sugary drinks and hold their urine, and concluded with key messages about the dangers of sugary packaged drinks for children's kidney health.

After the story, the children sang a song together titled *"I Love My Kidneys."* The lyrics conveyed a simple message encouraging children to care for their kidneys with three key

actions: drinking enough water daily, not holding in urine, and washing hands after using the bathroom. During the sing-along, the children enthusiastically sang the lyrics and danced to the rhythm of the music. This is in line with the theory which states songs is an effective method to deliver public health messages that result in improved education and changes in children’s behaviour (Sheffield & Irons, 2021). The next activity was a Q&A session, in which two children asked questions about why drinks must be filtered by the kidneys and why we need to take care of our kidneys.

Following that, the team handed out water bottles with a sticker message reading “I Love My Kidneys” to each child, with the hope that this would serve as a reminder to drink enough water every day, inline with the use of external rewards (through stickers) increased the effectiveness of the intervention (Fináncz et al., 2023). The activity concluded with an evaluation through a post-test game containing 3 questions about the dangers of sugary packaged drinks to the kidneys because game-based learning has a moderate to large effect on cognitive, social, emotional, motivation, and engagement outcomes (Alotaibi, 2024)

Table Pretest-Posttest Results on Children's Knowledge of the Dangers of Sugary Packaged Drinks

Knowledge	Pretest	Posttest
Excellent	5	25
Average	10	5
Poor	15	-

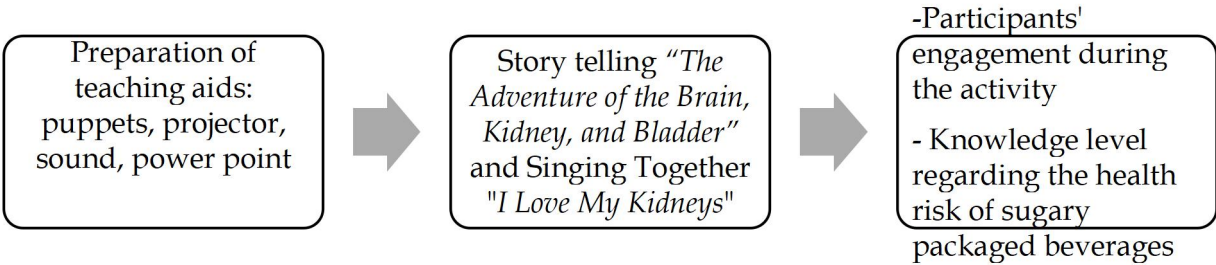


Figure 1. Activity Scheme



Figure 2. Educational Storytelling Activity

D. CONCLUSION

The community service team from Poltekkes Kemenkes Semarang conducted a kidney health education program for 30 kindergarten students at TK Aisyiyah 7 Magelang on May 26, 2025. Through interactive puppet storytelling "The Adventure of the Brain, Kidney and Bladder", singing together of "I Love My Kidneys" song, and Q&A sessions, children learned about the dangers of sweetened beverages and proper kidney care. Each student received a branded water bottle, reinforcing healthy hydration habits. The result of pre-test and post-tests showed improved understanding of kidney health among participants. The recommended next activity is to include parents as target participants in kidney health education, using appropriate educational media for health promotion. A suggestion for future community service activities is to evaluate children's attitudes and behaviors in maintaining kidney health after the implementation of storytelling on the dangers of sugary packaged drinks.

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