

Development of Nutrition Education Media ‘Sugar-Sweetened Beverages’ Pocket Book for Elementary School

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Abstract

Purpose: This study aims to develop nutrition education media in the form of a sugar-sweetened beverages pocketbook for elementary children and examining its validity.

Methodology: The type of research used was research & development with 4 sequential steps including analysis, design, development, and evaluation its content validity by 6 experts in the field of nutrition, language, and media.

Results: The title of pocket book produced in this study was "sugar-sweetened beverages" with a size of 10.5 cm x 14.8 cm (A6) consisting of 39 pages. The font type "Glacial Indifference" with a size of 7 was used, and the booklet was printed on glossy paper with a dominant color scheme of light blue, red, yellow, and orange. The overall average content validity indexed (CVIs) assessed by the nutrition expert, language, and media were 0.785, 1, and 0.775 which were in very suitable category.

Applications/Originality/Value: It can be concluded that this pocket book media on sugar-sweetened beverages has met the characteristics of learning media for elementary school children.

Introduction

Currently, obesity is a worldwide health problem that is increasing every year [1]. According to WHO, in 2021, the incidence of obesity in children over 5 years old reached 6.8%, while data from the Basic Health Research Survey (RISKESDAS) showed that the obesity rate in 2018 in children aged 5-12 reached 9.2% [2]. The increasing incidence of obesity each year will impact the increased risk of non-communicable diseases (NCD) in the following year [3].

Obesity can be caused by several factors, such as changes in diet and body activities in daily life that are not balanced with energy input, increase in energy intake from fat and sugar [4]. Lack of knowledge in choosing healthy and safe foods and snack consumption are considered as factors contributed to the increasing of obesity in school children [5]. Most children tend to choose foods and drinks that they like with a strong taste without paying attention to the nutrients contained in them.

Choosing snacks for elementary school children will lead to consuming Sugar-Sweetened Beverages (SSBs) regularly. The individual food consumption survey data shows that the proportion of sugar consumed is >50 g per day in the 5-12 year age group, which is 1.6% [6]. The consumption rate of sugar-sweetened beverages (SSBs) continues to increase every year because many school children are not yet aware of the importance of fulfilling balanced nutrition in health and do not yet know the impact of consuming the SSBs [7].

Factors that encourage the eating behaviour in elementary school children include the role of parents, schools, and peers [8]. Schools have an essential role in children's growth. Healthy canteens will influence student's habits in choosing the right snacks. Snacks provided by the school canteen will shape children's tastes and perspectives when choosing the snacks they consume. Children's consumption behaviour will depend on the snacks provided by the school. Good nutritional status is an indicator in elementary school children's growth and development process because if it is not addressed quickly and appropriately, it will have negative impacts until adulthood. Physical activity, consumption patterns, and eating habits at home and school will affect children's nutritional status [9]. Providing health nutrition education through learning media is a means or tool that helps the learning process as a place to convey messages to students, increasing effectiveness and efficiency in achieving learning goals [10].

Providing nutrition education can increase knowledge. Nutrition education must be provided with suitable media, such as pocket book. Pocket book have the same characteristics as books in general, only smaller in size, so they are easy to put in a pocket. Pocket book contain short texts and pictures, making them easier for children at school to understand. Learning with interesting reading media is needed to increase students' knowledge [11].

A previous study proves that pocketbooks as a medium for nutritional education can increase students' interest in reading [12]. The book media effective in increasing students' interest in reading. Pocket book learning media has an influence on elementary school children towards increasing knowledge because it can attract students' attention so that it is not boring and easy to carry because its size is small and informative can be read anytime and anywhere. The aim of this study was to develop nutrition educational media about sugar-sweetened beverages for elementary children.

Method

This research performed using research and development method, a research method used to create a product by assessing the level of feasibility or effectiveness of a product [13]. The research was conducted in 4 steps, including analysis, design, development, and evaluation of its validity followed by revision process (if necessary) so that the product developed meets the criteria for a good product and has no errors [14]. Analysis was performed based on the identified through Focus Group Discussions (FGD) involved 21 teachers responsible in implementation of Usaha Kesehatan Sekolah (UKS) from Muhammadiyah elementary schools in Surakarta and a literature review for the preparation of material on pocket book. The design phase involved the researcher in developing an appropriate instructional media and selecting content aligned with the characteristics of elementary school students, a pocket book was design using the Ibis Paint X and Canva application. During the development phase, the researcher created the instructional media by gathering all necessary resources for content development, reating illustrative images, selecting text, and designing the layout. In the evaluation phase, the researcher assessed the shortcomings of the developed media through validation tests conducted by nutrition experts, language experts, and media experts, with the aim of producing a final product that aligns with the characteristics of school-aged children. The validity test was done by 6 experts in the field of nutrition, linguistic, and media; then content validity index (CVI) was calculated; a revision will be made from validity test results. The CVI range from 0-1 which high values indicating good agreement.

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Results and Discussion

This research produced a nutrition education media entitled 'Sugar-sweetened beverages' in the form of pocket book used 4 steps including analysis, design, development, and evaluation of its validity. In the analysis phase, we used the results obtained from the previous FGD as a guideline and consideration for the development of the media development (Table 1) followed by literature review (Table 2). This phase encompassed an analysis of the problems faced by elementary school students, an assessment of the needs of elementary school students, and an analysis of the supporting media for learning.

Table 1. Problem Analysis Based on Focus Group Dicusion (FGD)

Problem	Solution
— The prevalence of unhealthy snacks in schools contributes to increased consumption of sugar-sweetened beverages among student [15].	— Providing definitions and characteristics of sugar-sweetened beverages to help students recognize them in everyday life.
— Children frequently consume a variety of sugar-sweetened Beverages [8].	— Educating children about the different types of sugar-sweetened beverages and understanding of recommended consumption levels.
— The consumption of sugar-sweetened beverages among children is influenced by factors such as taste, preference, economic considerations, and the ease of access to these drinks [18].	— Educating children about the ingredients, examples, and health consequences of consuming sugar-sweetened beverages.
— Lack of nutritional knowledge among a child is a growing concern [17].	— Providing education through engaging learning media for children.

Table 2. Problem Analysis Based on Literature review

Problem	Solution
Children's lack of understanding of healthy snacks and their habit of buying various types of snacks at school, leading to unrestricted snack choices [5].	Implementing a healthy snack education program for school children to enhance their understanding of nutritious food options and discourage the consumption of unhealthy snacks.
Children's dietary habits, characterized by frequent consumption of cariogenic snacks, especially during breaks and after-school activities, contribute to a higher risk of developing childhood obesity and dental caries [18].	Encouraging children to identify various examples of sugar-sweetened beverages, understand the recommended limits for their consumption, and learn about the consequences of excessive intake
School children often choose foods based on taste preferences rather than nutritional value [8].	Explaining to children about the ingredients and contents of sugar-sweetened beverages.
Children often choose cariogenic foods due to their sweet and pleasant taste. Additionally, these foods are typically more affordable, readily available, and come in a variety of attractive shapes and colors, making them appealing to children [19].	Providing education through engaging learning media to help children identify various types of sweeteners.

In the design phase, we focused on creating a pocket book about sugar-sweetened beverages. This involved writing the content and selecting relevant images to make learning fun and interesting for elementary school students. In the development stage, a pocket book learning media was produced using Ibis Paint X and Canva for layout design (Figure 1). The developed pocket book then validated by 6 experts in the field of nutrition experts, language, and media with the average CVI was 0.85 that categorized in very suitable (Table 3).

Cover	Page 1	Page 2	Page 3
	<p>BUKU SAKU MENGETAHUI SUGAR-SWEETENED BEVERAGES</p> <p>Olak, Khansa Muhta Taqobito Setyaningrum Rahmawati, Ph.D</p> <p>Edisi Pertama 2023</p> <p>Copyright © Universitas Muhammadiyah Surakarta, 2023 Hak cipta dilindungi undang-undang. Dilarang memperbanyak atau memindahkan sebagian atau seluruh buku ini dalam bentuk, secara elektronik maupun mekanis, termasuk didalampai mendistribusikan, menyalin, atau mempergunakan kembali tanpa izin tertulis.</p>	<p>KATA PENGANTAR</p> <p>Assalamualaikum Warahmatullahi Wabarakatuh,</p> <p>Alhamdulillah, dalam proses dan upaya kami penyusunan kegiatan ini, telah memperoleh bantuan dari Badan Penyelenggara Program Literasi Kesehatan (BPKK) yang telah memberikan dukungan dan bantuan teknis kepada kami dalam penyusunan buku ini. Kami mengucapkan terima kasih kepada BPKK yang telah memberikan dukungan dan bantuan teknis kepada kami dalam penyusunan buku ini.</p> <p>Penyusunan buku ini merupakan hasil dari proses yang panjang dan melibatkan banyak pihak. Kami mengucapkan terima kasih kepada semua pihak yang telah memberikan dukungan dan bantuan teknis kepada kami dalam penyusunan buku ini.</p> <p>Surakarta, Oktober 2023 Penulis</p>	<p>Daftar Isi</p> <p>Kata Pengantar..... 2</p> <p>Daftar Isi..... 3</p> <p>Pendahuluan..... 4</p> <p>Tujuan Pembelajaran..... 5</p> <p>Metode Pembelajaran..... 6</p> <p>Pengertian Sugar-Sweetened Beverages..... 7</p> <p>Macam-Macam Jenis Sugar-Sweetened Beverages..... 10</p> <p>Ciri-Ciri Sugar-Sweetened Beverages..... 11</p> <p>Contoh dan Kandungan Sugar-Sweetened Beverages..... 12</p> <p>Soda..... 13</p> <p>Kopi Kemasan..... 14</p> <p>Teh Kemasan..... 15</p> <p>Bubble Tea..... 16</p> <p>Minuman Serbuk Basi..... 17</p> <p>Minuman Serbuk Susu..... 18</p> <p>Bahan-Bahan Sugar-Sweetened Beverages..... 19</p> <p>Dampak Konsumsi Sugar-Sweetened Beverages..... 20</p> <p>Daftar Pustaka..... 21</p> <p>Lampiran..... 22</p>
<p>Page 4</p> <p>PENDAHULUAN</p> <p>A. Latar Belakang</p> <p>Buku saku mengenai media pendukung dari pembelajaran media (Media Pembelajaran) adalah alat yang digunakan untuk menyampaikan informasi dan pengetahuan yang berkaitan dengan materi pembelajaran. Media pembelajaran ini dapat berupa benda mati atau benda hidup yang dapat digunakan untuk menyampaikan informasi dan pengetahuan yang berkaitan dengan materi pembelajaran.</p> <p>Buku saku mengenai media pendukung dari pembelajaran media (Media Pembelajaran) adalah alat yang digunakan untuk menyampaikan informasi dan pengetahuan yang berkaitan dengan materi pembelajaran. Media pembelajaran ini dapat berupa benda mati atau benda hidup yang dapat digunakan untuk menyampaikan informasi dan pengetahuan yang berkaitan dengan materi pembelajaran.</p>	<p>Page 5</p> <p>TUJUAN PEMBELAJARAN</p> <p>Tujuan Umum</p> <ul style="list-style-type: none"> Menyebutkan pengertian media pendukung dari pembelajaran media (Media Pembelajaran). Menyebutkan jenis-jenis media pendukung dari pembelajaran media (Media Pembelajaran). Menyebutkan kelebihan dan kekurangan media pendukung dari pembelajaran media (Media Pembelajaran). <p>Tujuan Khusus</p> <ul style="list-style-type: none"> Menyebutkan pengertian media pendukung dari pembelajaran media (Media Pembelajaran). Menyebutkan jenis-jenis media pendukung dari pembelajaran media (Media Pembelajaran). Menyebutkan kelebihan dan kekurangan media pendukung dari pembelajaran media (Media Pembelajaran). 	<p>Page 6</p> <p>METODE PEMBELAJARAN</p> <p>Metode pembelajaran media pendukung dari pembelajaran media (Media Pembelajaran) adalah alat yang digunakan untuk menyampaikan informasi dan pengetahuan yang berkaitan dengan materi pembelajaran. Media pembelajaran ini dapat berupa benda mati atau benda hidup yang dapat digunakan untuk menyampaikan informasi dan pengetahuan yang berkaitan dengan materi pembelajaran.</p>	<p>Page 7</p> <p>Pengertian Sugar-Sweetened Beverages</p> <p>Sugar-sweetened beverages (SSBs) are beverages that contain added sugars. They are often high in calories and can contribute to weight gain, tooth decay, and other health problems. Examples of SSBs include sodas, fruit-flavored drinks, and sports drinks.</p>
<p>Page 8</p> <p>Macam-Macam Jenis Sugar-Sweetened Beverages</p> <p>Soda is a type of SSB that is made with carbonated water and added sugars. It is often high in calories and can contribute to weight gain, tooth decay, and other health problems.</p>	<p>Page 9</p> <p>Ciri-Ciri Sugar-Sweetened Beverages</p> <p>Sugar-sweetened beverages (SSBs) are characterized by their high sugar content. They are often high in calories and can contribute to weight gain, tooth decay, and other health problems.</p>	<p>Page 10</p> <p>Contoh dan Kandungan Sugar-Sweetened Beverages</p> <p>Examples of SSBs include sodas, fruit-flavored drinks, and sports drinks. The following table shows the sugar content of some common SSBs.</p>	<p>Page 11</p> <p>Dampak Konsumsi Sugar-Sweetened Beverages</p> <p>Consuming too many SSBs can lead to weight gain, tooth decay, and other health problems. It is important to limit the amount of SSBs you drink each day.</p>

<p>Page 12</p>	<p>Page 13</p>	<p>Page 14</p>	<p>Page 15</p>
<p>Page 16</p>	<p>Page 17</p>	<p>Page 18</p>	<p>Page 19</p>
<p>Page 20</p>	<p>Page 21</p>	<p>Page 22</p>	<p>Page 23</p>
<p>Page 24</p>	<p>Page 25</p>	<p>Page 26</p>	<p>Page 27</p>
<p>Page 28</p>	<p>Page 29</p>	<p>Page 30</p>	<p>Page 31</p>
<p>Page 32</p>	<p>Page 33</p>	<p>Page 34</p>	<p>Page 35</p>

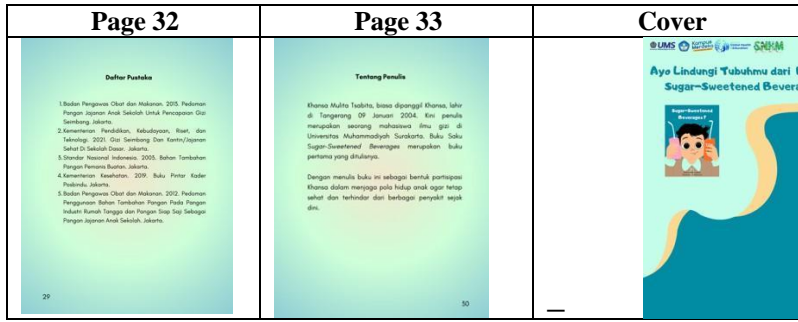


Figure 1. The Initial Design of 'Sugar-Sweetened Beverages' Pocket Book

Several suggestions from nutrition experts were incorporated into the pocketbook, and subsequent revisions were made based on their feedback (Table 4).

Table 3. Expert Judgment Assessment

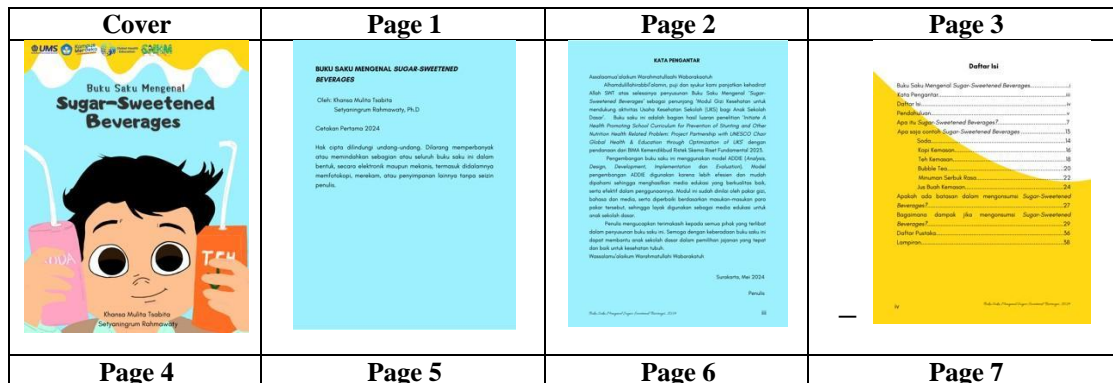
—	Expert	—	CVI Value	—	Catego ry
—	Nutrition expert	—	0.78	—	very suitable
—	Media expert	—	0.77	—	very suitable
—	Language expert	—	1	—	very suitable
—	Overall	—	0.85	—	very suitable

Table 4. Overall Comment and Suggestions from the Experts

	Comments or Suggestions
Nutrition expert	Adding positive words that are persuasive. The choice of words should be more carefully considered. Overall, the pocketbook is well-designed, but minor revisions are needed regarding the selection of images and colors. The use of complex scientific terms that may be difficult for children to understand should be reduced.
Media expert	The use of illustrations was given more consideration for the target audience. A persuasive approach was employed, reducing scientific jargon and incorporating more illustrative images.
Language expert	Fix spelling and foreign terms Fix some terms that need to be explained

After incorporating the experts' suggestions, the pocket book underwent revisions. These revisions included adjusting the paper size to 10.5 cm x 14.8 cm (A6), using Ibis Paint X Pro and Canva for illustrations, adopting a light blue, red, yellow, and orange color scheme for the cover, and increasing the number of pages to 39. The final product was printed on glossy paper.

The following is the final design for developing educational media for a pocket book about sugar-sweetened beverages:



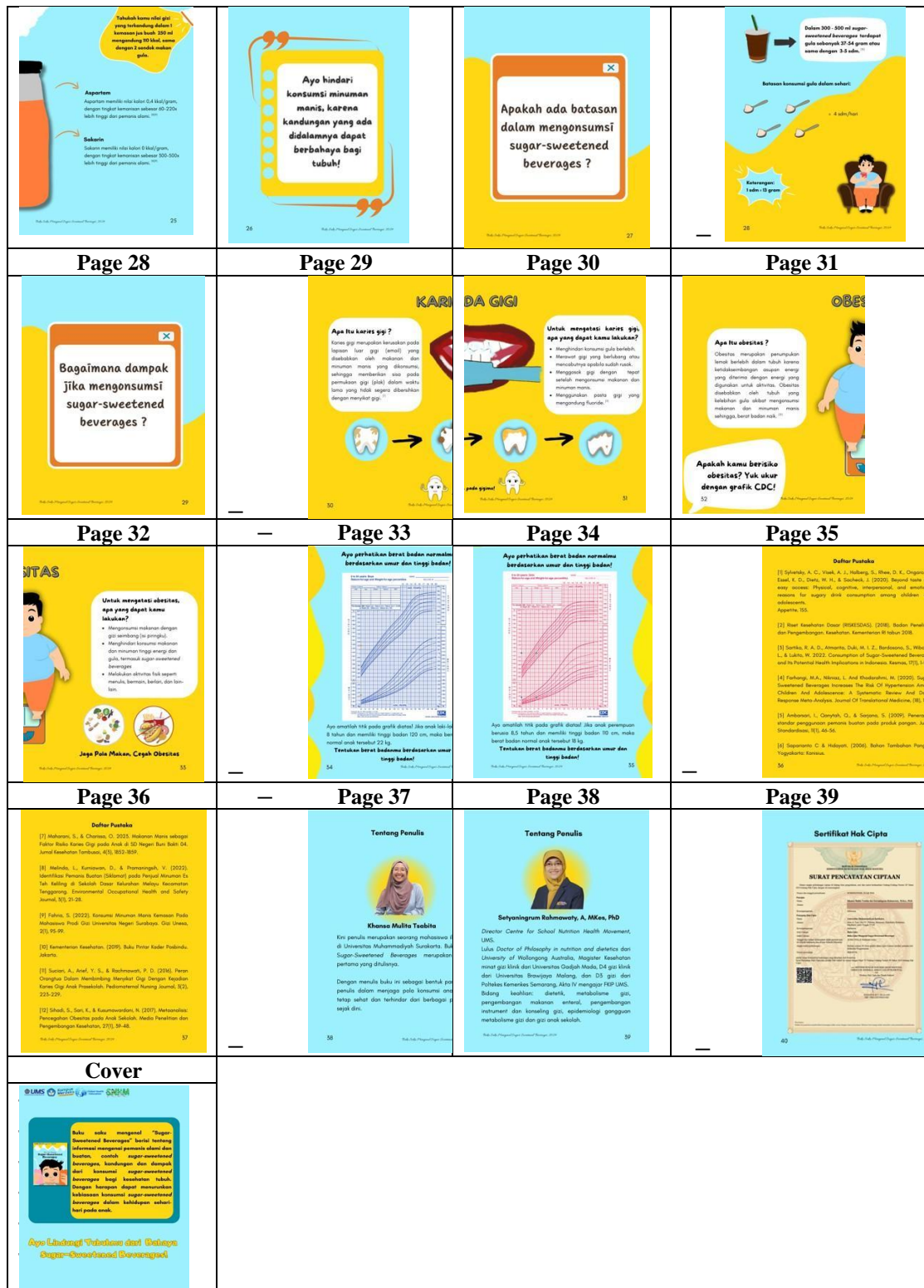


Figure 2. The Final Design of ‘Sugar-Sweetened Beverages’ Pocket Book

Discussion

School-aged children are a vulnerable group for nutritional problems, such as overweight or obesity. Obesity is one of the main causes of non-communicable diseases (NCDs) in Indonesia. Based on the FGD and a literature review, it was found that elementary school children still consume unhealthy snacks, especially sugary drinks. This is because children

are not yet aware of the impacts of the foods they consume, thus there is a need for education for elementary school children regarding the limitations of sugary drink consumption through interesting learning media.

Pocket book learning materials have a significant impact on elementary school students' knowledge. These materials are effective in capturing students' attention, making learning engaging rather than monotonous. Their compact size allows for easy portability, while their informative content enables students to read and learn anytime and anywhere [12]. Students' interest in the presented learning materials serves as a significant indicator of the success of the learning process. The content of pocketbooks is not limited to text but is also enhanced with illustrations to reinforce the material. This is because children primarily focus on the cover and the abundance of illustrations when selecting reading materials, factors that significantly increase their interest.

Learning through pocket book is one of the components that influences human behavior as a significant portion of our knowledge is acquired through visual means. Children aged 6-14 are at the optimal age to receive nutrition education due to their heightened curiosity and tendency to imitate daily behaviors. By fostering positive attitudes and providing accurate knowledge, it is anticipated that children will develop healthy habits and understand the nutritional value of various foods and beverages [11].

Based on the results of the content validity test on the pocket book "Sugar-Sweetened Beverages" was categorized as "very suitable" according to language, media, and nutrition. However, there are several parts of the pocketbook that require improvement and consideration from the experts. Suggestions provided by the experts regarding several aspects have been improved, such as the use of appropriate and contrasting backgrounds on each page, supported by additional elements to add a more attractive impression for readers without weakening the visual elements [20]. For the layout, placing the book title in the center with a larger size can give a more dominant impression, and placing the page numbers at the bottom, adjusted to the book's color, is recommended [21]. The use of margins in the pocketbook to provide a border distance from the edge of the paper and avoid the risk of images or text becoming invisible when printed is also suggested.

This pocket book is used as a supporting media in nutrition education learning, aiming to stimulate the desire to learn, facilitate the process of understanding the material, thus increasing knowledge. The advantage of this pocket book is that it is easy to carry around due to its small size, and can be read anytime and anywhere with informative material. This pocketbook medium has an appealing design and can be used as a memorization tool, especially for materials that need to be recalled quickly. However, to achieve optimal learning outcomes, the use of pocketbooks should be combined with other, more interactive learning media.

Conclusion

This pocket book media was developed using the Ibis Paint X and Canva applications. The booklet, measuring 10.5 cm x 14.8 cm (A6), consists of 39 pages. The font "Gla-cial Indifference" was used in a size of 7, and the booklet was printed on glossy paper with a dominant color scheme of light blue, red, yellow, and orange. This pocket book media has been validated by experts, including nutritionists, linguists, and media experts, with scores of 0.785, 1, and 0.775, respectively, falling into the "very suitable" category. Through this medium, it is hoped that children will change their behavior towards healthier snack choices and limit their consumption of sugar-sweetened beverages. Excessive consumption of sugary drinks can increase the risk of early childhood obesity and hinder children's growth and development.

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