

DIVERSIFICATION OF IRONWOOD WASTE AS EDUCATIONAL DENTAL KEYCHAINS

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ABSTRACT

The incidence of oral disease is primarily due to neglected dental and oral hygiene factors. The leading cause of oral hygiene problems is the lack of knowledge about dental and oral maintenance, so the behavior applied is inappropriate and tends to ignore oral hygiene. This program aims to create media for dental and oral health counseling and increase sales. The method used is counseling, training, mentoring, and evaluation. This program resulted in diversified ironwood waste products and promotions to convey dental and oral health messages. Diversification of ironwood waste into educational dental keychains is expected to improve the level of dental and oral health of the community, especially in South Kalimantan, and is expected to increase sales.

Keywords : *Diversification, Ironwood Waste, Educational Dental Keychains*

1. INTRODUCTION

Oral and dental health is an integral component of general health. The risk of oral disease often involves common diseases (Hidayat R, 2016). The incidence of oral disease is primarily due to neglected dental and oral hygiene factors. According to the 2018 Basic Health Research based on age group, ages 10-14 have a proportion of dental and oral health problems of 55.6%, and only 9.4% of them receive treatment from dental and medical personnel. As many as 96.5% of adolescents in the age range of 10-14 years have the behavior of brushing their teeth every day, but only 2.1% who brush their teeth on time (Ramadhan A, Cholil, 2016; Kemenkes RI, 2018).

Adolescents often get experience in dental and oral health problems, including caries, irregular tooth position, tooth injury, staining of teeth, gingivitis during puberty triggered by increased endocrine hormones, and poor oral hygiene (Nowak AJ, Christensen JR, Townsend JA, 2019). The leading cause of oral hygiene problems is the lack of knowledge about dental and oral maintenance, so the behavior that is applied is inappropriate and tends to ignore oral hygiene. One of the efforts to create awareness and proper dental and oral health maintenance behavior is to increase this knowledge with health promotion (Deswita, 2013; Ramadhan A, Cholil, 2016; Nursyamsi, Luthfiah, 2017; Rosmalia D, 2017; Rahtyanti GCS, Hadnyanawati H, 2018).

In conducting health education, tools or media are needed (Harsismanto J, Oktavidiati E, 2019; Hartati R, 2020). This tool is arranged based on the principle that knowledge in every human being can be received or captured through the five senses. So in counseling, props or aids are needed to

perceive educational/teaching materials (Effendy, 2013). In clarifying abstract concepts and transforming the knowledge of the variables conveyed (Prasko., 2018). The concept can be explained using media such as posters, flip charts, leaflets, rubrics, and brochures (Arsyad., 2018; Astuti NR, Kusumastiwi PO, Dewanto I, Salecha AD, 2019). However, in this community service, keychains are used as a medium for health promotion. Keychains are believed to be effective as media for promoting information to the public in health education. The advantages of keychains are that they are smaller in size, easy to carry, read, and attractive as souvenirs compared to other image media, which are larger and designed to be explicitly read (Jalanti, Sanuddin Putra, 2018).

The authors found that the production department disposed of ironwood waste based on the preliminary study. This has an impact on the environment. Based on this background, the researcher wants to serve the community by diversifying ironwood waste as educational dental keychains.

2. PROBLEM AND QUESTION

The problem in the field is that most of the ironwood waste is left over from handicrafts, disposed of, or burned, causing environmental impacts. So we made efforts to diversify. The researcher ask the question how can ironwood waste that is disposed of be used as an economic value to improve dental and oral health?

This activity was carried out at SAEKAYU Crafts, at the Antasari Bintang Residence Block I30 Banjarmasin, South Kalimantan.



Figure 1. Location Map of Community Service Activities

3. THEORY

Dental and Oral Health Maintenance

3.1 Brushing Teeth

1) Selection of toothbrushes

Brushing your teeth isn't just about proper brushing technique. But also the selection of brushes and their maintenance needs to be considered. The toothbrush selection includes bristles, brush necks, and a toothbrush handle. The bristles of a good toothbrush are soft. Avoid bristles that are too stiff and rough that can be damage soft tissue. Note that the tips of the bristle filaments should be rounded to protect the soft tissues from abrasion. Toothbrush bristles can be coated with

antimicrobials such as chlorhexidine and triclosan. Still, their benefits do not last in the long term, and reducing the number of bacteria are no better than toothpaste. The toothbrush neck that connects the toothbrush head and handles is angled to make it easier for the bristles to clean the gums and teeth better without pressing the handle hard against the teeth. The selection of the toothbrush handle also needs to be considered to facilitate direction in the process of brushing your teeth. The handle of a toothbrush ideally has a finger holder in the form of an indentation and is made of rubber so that it does not slip easily. It helps the user precisely direct the bristles' angle and balance (Wiley J, 2012).

2) Selection of toothpaste

Toothpaste contains three main features, namely taste, abrasiveness, and fluoride. The taste of toothpaste is believed that the better the taste, the more diligent people will brush their teeth. The abrasives in toothpaste serve to remove stains on the tooth surface. However, if excessive can erode tooth structure, especially dentin. The fluoride content is suitable for remineralizing teeth and preventing cavities. The fluoride concentration in standardized toothpaste of around 1,000 ppm is relatively safe for daily use. The recommended size for using toothpaste for ages over six years is peas/pearl and rice for those under six years (Wiley J, 2012).

3) Toothbrush Maintenance

Toothbrushes are at risk of becoming a breeding ground for pathogens. The bristles between toothbrushes that touch each other allow bacteria to move and thrive, especially in the open air in the toilet, increasing the potential for toothbrushes to be indirectly contaminated with dirt. Oral biofilm, *E. coli*, and other fecal bacteria found on brush bristles came from nearby toilet aerosols as they were left exposed during rinsing. Fungi and bacteria such as *Staphylococci*, *Streptococci*, *Candida*, *Haemophilus*, *Corynebacterium*, *Pseudomonas*, and *Coliforms* stick to toothbrushes that are used for several weeks. Therefore, complete the bristles with a lid and place the toothbrush away from the toilet (Wiley J, 2012). The body of a healthy person can maintain homeostasis from pathogens. However, contaminated toothbrushes are dangerous for people with weakened immune systems, such as those undergoing chemotherapy or undergoing uncontrolled systemic diseases. The person's toothbrush and oral health should be carefully considered by an experienced doctor (Wiley J, 2012). Changing the toothbrush every month and washing it regularly to decontaminate the bristles using antimicrobials, mouthwash, and ultraviolet light is recommended. One of the easiest ways to do this is to soak the toothbrush for 20 minutes in a mouthwash solution and then dry it (Wiley J, 2012).

4) Toothbrushing Time

Brushing time is recommended for 2 minutes or 120 seconds to achieve plaque-free status and must be balanced with the correct method of brushing teeth. The correct time to brush your teeth twice daily is in the morning, after breakfast, and before bed. Brushing your teeth at night before going to bed is very important because the oral cavity condition is dry due to slowed saliva flow during sleep. Saliva, which contains a buffer, serves to counteract the acid bacteria produce. If you sleep without brushing your teeth, food debris and plaque left behind have a more significant potential to cause tooth demineralization (Wiley J, 2012).

5) Toothbrushing Method

There are several techniques for brushing teeth, namely (Nurjannah N, Herijulianti E, 2012):

1. Vertical Technique

The vertical technique is the most common technique used without requiring particular practice. This vertical technique is performed with both jaws clenched and exposing the buccal surfaces of the teeth with the bristles perpendicular to the teeth and moving them up and down. Then for the lingual surface, position the bristles perpendicular to the teeth and do the same movement with the jaw open.

2. Horizontal Technique

The horizontal technique of performing forward and backward movements on the occlusal surface. This horizontal movement is often called the "scrub brush technic," which is believed to be by the anatomical shape of the occlusal surface.

3. Roll Technique

This technique is often recommended because it is simple, efficient, and used all over the mouth. The roll technique is also called the "ADA-roll technique." The bristles are positioned on the gingiva, as far as possible from the occlusal surface, with the tip of the bristles pointing toward the apex and the side of the bristles being gently moved across the tooth surface. When the bristles pass through the clinical crown, they are nearly perpendicular to the tooth surface. This technique, in addition to cleaning debris in the interproximal area, also provides massage and cleaning of the gingiva.

4. Fones Technique

This technique is like following the path of food in the mouth when chewing and is recommended for young children because it is easy to do. The bristles of the brush are placed perpendicular to the buccal and labial surfaces of the occlusive teeth, moving the brush in large circles so that the gingiva and the maxillary and mandibular teeth are brushed simultaneously. The mouth is opened and brushed in the same motion on the lingual and palatine surfaces, only in smaller circles.

5. Toothbrushing Sequence

Start from the outer surface of the upper and lower jaw teeth by positioning the bristles at an angle to the gums and moving them in a circular motion. The inside of the front teeth of the upper and lower jaws position the toothbrush vertically and move it up and down, while the inner back teeth move the brush in a circular motion. In the bitten part, position the bristles upright and move them back and forth. Then brush your tongue and rinse your mouth with water (Hidayat and Tandiari, 2016).

6) Clean the tongue

Biofilms develop not only on the surface of the teeth but also on the surface of the tongue. The dorsum of the tongue is a risk area for microbes to thrive and contribute to enamel lesions, periodontal lesions, and halitosis. Tongue cleaning can reduce dental plaque buildup and candida infections. The biofilm layer on the tongue is quite challenging to remove; therefore, cleaning the tongue when brushing teeth should not be missed. Tongue cleaning is done manually using a toothbrush that is moved in the direction of the tongue surface several times (Wiley and Sons, 2012).

Use of Dental Floss

Dental floss or dental floss serves to clean debris in the interproximal areas of the teeth that are not reached by a toothbrush. Dental floss has two types: dental floss rolls and preloaded flossers with various designs. Some are thick, thin, flat, and round and can be coated with wax, fluoride, and xylitol. Dental floss rolls are in the form of long threads, and how to use them by cutting the thread length as needed. Then, tie the end of the thread on the middle finger. Thumb and index finger as the holder of the thread movement control. Place the floss between the teeth, push the floss posteriorly in a distal "C" shape and move the floss back and forth and up and down to clean the interproximal portion of each tooth and repeat. Meanwhile, the preloaded flosser is in the form of a short thread with a holder, and the method of use is the same as before, except that this type has the advantage of mint flavor and is coated with wax to make it easier to pass between teeth (Wiley J, 2012).

Use of Mouthwash

Mouthwash is a chemical plaque control of removing the biofilm that is not reached by a mechanical toothbrush. The ideal requirements for mouthwash are non-toxic/non-toxic, bactericidal, or able to kill bacteria, penetrate the biofilm (bacterial layer), and have low drug resistance (Wiley J, 2012).

Cariogenic and Noncariogenic Foods

Cariogenic foods are high in sugar, low in pH, high in carbohydrates, and sticky. Non-cariogenic foods are high in protein, low in carbohydrates, and non-sticky (Wiley J, 2012).

This program is by diversifying ironwood waste products into educational dental keychains. Definition of product diversification according to Philip Kotler (2016) is one way to improve existing business performance by identifying opportunities to add attractive businesses unrelated to the company's current business. Product diversification is defined as an expansion of the selection of goods and services sold by the company by adding new products or services or improving the type, color, model, size, and type of existing products to obtain maximum profit. Product diversification or product differences are defined as different groups of goods if there are essential factors that can differentiate goods from one seller. This factor is crucial because it can cause different tastes in buyers.

The company diversifies its products to take advantage of existing strengths. Current business in marketing, production, technology, or finance. Usually, the development of diversification is most appropriate for a company if:

- a. The core marketing system shows little additional opportunity for growth or profit.
- b. Opportunities outside the core marketing system are preferable.

There are three kinds of diversification strategies carried out by the company for a product, including:

- 1) Concentric diversification strategy.

This strategy aims to attract new consumers by adding new products with the same technology and marketing methods.

2) Horizontal diversification strategy

This strategy is carried out to expand the product line offered to current consumers. This product line expansion is carried out with different technology or not related to the technology used in current production.

3) Conglomerate diversification strategy

This strategy aims to attract new consumer groups through diversification into non-technologically related products, the market products that the company currently serves. Companies in diversifying products should study and research consumer behavior, mainly marketed goods and services, to identify the possibilities that lead to satisfaction. In general, companies that can grab consumers' attention will become customers. The company carries out product diversification to minimize sales risk. That is, if a type of good is not sold, it can be supported by other goods produced by the company.

We contribute to providing direction and materials for product diversification. The material provided is about maintaining dental and oral health for product development by a concentric diversification strategy.

4. METHOD

The method we use in this program is counseling about dental and oral health, training in the manufacture of educational dental keychains, mentoring activities and evaluating activities. There were 15 participants involved. The steps for implementing this community service activity can be described as follows:

a. Counseling

Conducted counseling with material on dental and oral health as well as material on product diversification. In addition, the material is also given about how to promote in the marketplace.

b. Training

After the counseling, training was conducted on product design and content design. Product design is done by designing the product according to the dental and oral health materials. After the product is finished, training is carried out on promoting it in the marketplace to sales evaluation.

c. Mentoring

Assistance is carried out continuously from the beginning of production to product evaluation.

d. Evaluation

Product evaluation is done by looking at sales turnover after product diversification.

6. RESULT AND DISCUSSION

a. Result

The implementation of community service carried out by the community service team of the Dental Medicine Study Program at Lambung Mangkurat University, which began in June 2022, obtained the following results:

1. Diversified ironwood waste products

The following is a diversified product of ironwood waste as educational dental keychains. The product is made from waste wood which is shaped like a tooth, and there are dental health messages such as:

a) Did you know?

The bristles of a good toothbrush are soft. Avoid hair that is too stiff and coarse because it will damage the soft tissue.

b) Did you know?

Toothpaste contains three main features, namely taste, abrasiveness, and fluoride.

c) Did you know?

It is believed that the better the taste of toothpaste, the more diligently people brush their teeth.

d) Did you know?

The abrasives in toothpaste remove stains on the tooth surface; however, if excessive can erode tooth structure, especially dentin.

e) Did you know?

The fluoride content is suitable for remineralizing teeth and preventing cavities.

f) Did you know?

The recommended size for using toothpaste for ages over six years is peas/pearl and rice for those under six years.

g) Did you know?

Toothbrushes are at risk of becoming a breeding ground for pathogens. The bristles between toothbrushes that touch each other allow bacteria to move and thrive, especially in the open air in the toilet, increasing the potential for toothbrushes to be indirectly contaminated with dirt. Therefore, complete the bristles with a lid and place the toothbrush away from the toilet.

h) Did you know?

Changing the toothbrush every month and washing it regularly to decontaminate the bristles using antimicrobials, mouthwash, and ultraviolet light is recommended.

i) Did you know?

Brushing time is recommended for 2 minutes or 120 seconds to achieve plaque-free status and must be balanced with the correct method of brushing teeth.

j) Did you know?

The correct time to brush your teeth twice daily is in the morning, after breakfast, and before bed.

- k) Did you know?
If you sleep without brushing your teeth, food debris and plaque left behind have a more significant potential to cause tooth demineralization.
- l) Did you know?
Tongue cleaning can reduce dental plaque buildup and candida infections.
- m) Did you know?
Tongue cleaning is done manually using a toothbrush that is moved in the direction of the tongue surface several times.
- n) Did you know?
Dental floss or dental floss serves to clean debris in the interproximal areas of the teeth that are not reached by a toothbrush.
- o) Did you know?
Mouthwash is a chemical plaque control of removing the biofilm that is not reached by a mechanical toothbrush.
- p) Did you know?
Cariogenic foods are high in sugar, low in pH, high in carbohydrates, and sticky.
- q) Did you know?
Non-cariogenic foods are high in protein, low in carbohydrates, and non-sticky.
- r) Did you know?
Cereal is a non-cariogenic food as a good source of energy, minerals, vitamins, and fiber for teeth.
- s) Did you know?
Yogurt is a low-calorie non-cariogenic food, a good source of calcium and probiotics for teeth.
- t) Did you know?
Milk is a non-cariogenic food source of calcium which is good for teeth.
- u) Did you know?
Tea contains fluoride, which is good for teeth.
- v) Did you know?
Chocolate is a cariogenic food that is high in fat and sugar.
- w) Did you know?
Potato chips are cariogenic food high in fat, salt, and sugar, which are unsuitable for teeth.
- x) Did you know?
Soda drinks have erosive properties and are high in sugar which is not suitable for teeth.
- y) Did you know?
Ice cream is a cariogenic food high in fat and sugar.



Figure 2. Examples of diversified products

4) The promotion process in the market place that is carried out

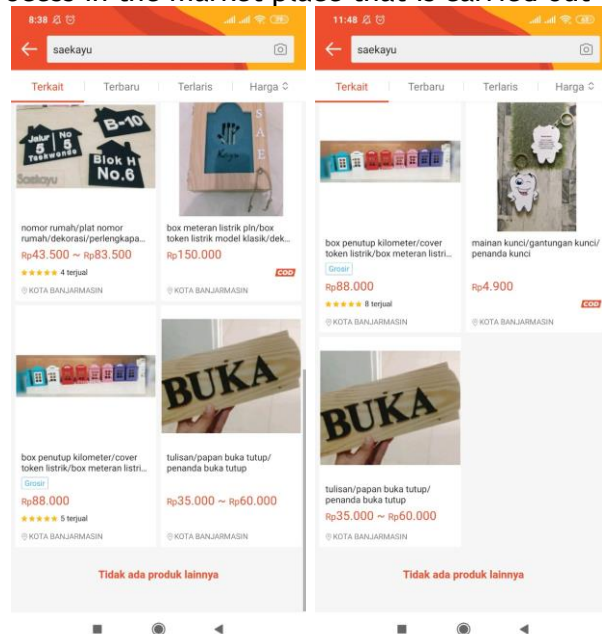


Figure 3. Promotion in the market place before (left) and after (right) product diversification

b. Discussion

In the community service carried out at SAEKAYU, it was found that the SAEKAYU carried out a product diversification strategy. These develop products by diversifying the products produced. It aims to attract consumers to make repeat purchases. Product diversification also makes the market share owned by SAEKAYU wider. By the opinion of Amirullah (2015) explains that diversification is a sub-strategy carried out by adding or expanding new products or services. SAEKAYU implement a concentric diversification strategy, where the addition of products is still related to the previous product. The linkages in question are marketing, raw materials, and technology used. Tjiptono (2019) opinion explains that the concentric diversification strategy offers new products that are still related to marketing and technology. The new product, as the previous one, has the same target market: handicrafts made of wood. The technology linkage is also the same, using a wood-cutting machine. The diversity of products produced is also inseparable from the implementation

of the elements of the product diversification strategy. According to Amirullah (2015), the elements of product diversification include product type, product type, color, fashion, and product size. Product diversification needs to be done to anticipate the saturation of a product. Consumers will be more interested in the diverse types and types of products offered. According to Philip Kotler (2016), products can be classified based on their type, including based on form, aspects of durability, and consumption purposes. At the same time, product types are items in a product with a specific shape in other product forms. According to Philip Kotler (2016), the diversification of a product must follow current trends so that consumers are interested in buying.

In addition to providing benefits for SAEKAYU, this product is also expected to increase dental and oral health knowledge. According to Jalanti, Sanuddin Putra (2018), keychains are believed to be effective as media for promoting information to the public in health education. The advantages of keychains are that they are smaller in size, easy to carry, read, and attractive as souvenirs compared to other image media, which are larger and designed to be explicitly read.



Figure 4. Community Service Team

6. CONCLUSION

Diversifying ironwood waste into educational dental keychains is expected to improve dental and oral health in the community, especially in South Kalimantan. It is expected to be able to increase sales. For recommendation, it is necessary to do further community service, carry out to school for education children.

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