



Mastication Profile and Alternative Healthy Mastication Model using Coconut Frond Shaving in Karo Women

Ulina Karo-Karo^{1*}, Ida Yustina², ETTY Sudaryati¹, Fikarwin Zuska³

¹. Faculty of Public Health Universitas Prima Indonesia.

². Faculty of Public Health Universitas Sumatera Utara.

³. Faculty of Social and Political Sciences Universitas Sumatera Utara.

*Corresponding Author: Ulina Karo-Karo

Abstract

Introduction: The use of tobacco in mastication activity has been widely known throughout the world. In China, the prevalence of mastication activity using betel leaves during student age is around 3.9%. Karo women in Deli Serdang are one of the population in Indonesia whose known have mastication habit since a long time ago. This study aimed to know the profile of the mastication model in Karo women as a primary aim and introduce coconut frond shavings mastication as the healthy mastication model. **Method:** This research was a combination of qualitative-quantitative diffusion of innovations research, with four stages, those are: diagnosis of action, plan of action, implementation of actions, and evaluation of an action. **Results:** Systolic blood pressure, diastole blood pressure, and blood sugar levels among coconut fronds chewers were less than tobacco chewers. This data also showed statistically different among two variables ($p < 0, 05$). **Conclusion:** It may indicate that the health status of chewers tobacco is far worse than the health status of the chewers' shavings of coconut fronds. From the process of transferring this technology, obtaining togetherness in vigorous editing becomes an alternative to adopt healthy mastication can be done more quickly.

Introduction

Improving the quality of life of the community is integrated into the health status of the community, to be free from health problems. Various health problems today where morbidity and mortality from infectious diseases began to shift with increasing non-infectious diseases (NID) [1, 2]. NIDs such as cancer, heart disease, diabetes mellitus, chronic obstructive pulmonary disease, and other chronic diseases are the leading causes of death globally [3, 4]. In 2030 the epidemiological transition from infectious diseases will be converting increasingly to NID.

World Health Organisation (WHO) projecting the number of illnesses due to NID will increase to 71% of total deaths, consisting of cardiovascular disease (37%), cancer (13%), chronic respiratory disease (5%), diabetes (6%), and non-disease other infectious (10%) [3, 5, 6]. Non-infectious diseases have numerous risk factors, including tobacco consumption (fuel and chewable), unhealthy

diet, physical inactivity, and excessive alcohol consumption. From any of these risk factors, high tobacco consumption plays the primary role as a cause of cardiovascular disease, DM, cancer and chronic respiratory diseases [3, 6]. The use of tobacco in mastication already acknowledged throughout the world. In China, among teenage students, the overall use of betel nut in mastication is 3.9% [7]. In the immigration area of South Asians, such as Bangladesh have the highest prevalence of using betel nut (mostly with tobacco) from around 30% to more than 90% in men [8].

The betel nut mastication community has its reasons why they chew betel nut [7]. According to the public, mastication betel has provided benefits that can provide pleasure such as smoking, as an activity in leisure time, can eliminate breath odor, and can strengthen teeth [9]. Tobacco can be made in cigarettes, chewed, and inhaled. Nicotine and cigarette smoke will come out of tobacco

in the process of smoking (inhaling) or mastication [10]. Nicotine, which is carried in the bloodstream can affect various parts of the body. Nicotine can speed up the heart rate (can be 20 times faster within a minute of normal state), lower the skin temperature by one or two degrees due to the narrowing of blood vessels of the skin, and causes the liver to release sugar into the bloodstream [11, 12]. Nicotine has a significant influence on the brain and nervous system [13, 14]. It can also provide a calming effect. However, nicotine is also an addictive drug or cause addiction [15, 16].

In addition to causing damage to the teeth, tobacco also gives an effect to increase the blood pressure. Smoking two cigarettes can increase blood pressure 10/8 mmHg for 15 minutes. Increased blood pressure in smokers is due to the nicotine stimulates the release of vasopressin and adrenocorticotrophic hormone.

These substances play a direct role in increasing blood pressure and heart rate rhythm [14]. Karo women in Deli Serdang are one of the population in Indonesia whose known have mastication habit since a long time ago. This condition persisted until today, whether every day or during traditional ceremonies. The unique thing about Karo tribes is that the habit of mastication is usually followed by snuffing tobacco.

This activity is a routine for generations. This non-eliminating tobacco production activity causes new behaviors in the community, where when tobacco prices increase expensive or when tobacco is difficult to find, there are a group of Karo women who use coconut fronds by being shrunk to replace the temporary position of tobacco.

Because of the lack of data, the research aims to know the profile of the mastication model in Karo women as a primary study and introduce coconut frond shavings mastication as the healthy mastication model to replace tobacco.

Method

The method of this research was a combination of quantitative-qualitative research, conducting diffusion of innovation with the action research approach or known

as action research. The action research based on four stages, those are action diagnosis, action plan, action implementation, and action evaluation. The researcher conducted this study in Suka Julu Village, Karo Regency, Indonesia, on April-June 2018. Computation of informants based on snowballing sampling techniques. The samples or informants were selected according to the results of interviews or observations made by researchers.

The number of informants is not limited, can be increased during the research process takes place. Nevertheless, there were still inclusion criterions in determining an informant, especially those who have carried out tobacco mastication activities for five years in minimum, must be honest, obeying promises, obeying rules.

Furthermore, the exclusion criteria were the members of the different groups in the research setting. Data collection was carried out using observation techniques, interviews, focus group discussion (FGD), counseling, and healthy joint editing practices. We used triangulation techniques to test data validity.

The researcher has ensured that daily records of interviews with informants and observational diaries had collected well. The results were cross-checked against the real diaries, to ensure no conflicting information between the diary interviews, diaries observation, focus group meetings, multi-stakeholder focus group discussions, counseling meetings, and joint gathering.

If there were differences in the information or irrelevant information, researchers would explore these differences and confirm the source of these differences from other sources. Data analysis was done by the technique of "ongoing analysis," which was an analysis that occurs in the field based on the data obtained.

Results

The difference in health status in 50 Karo women who chew tobacco compared to 50 Karo women who chew coconut frond shavings were carried out by researchers. The results of these studies showed that systolic blood pressure, diastole blood pressure, and blood sugar levels among coconut fronds chewers were less than tobacco chewers.

This data also showed statistically different among two variables ($p < 0, 05$) (Table 1). Table 2 showed that the dental health of the

coconut fronds shaving group was also better than the tobacco group and statistically different ($p < 0, 05$).

Table 1: Differences in Systolic Blood Pressure, Diastole and Blood Sugar Levels in Tobacco Chewers and Coconut Fronds Chewers of Karo Woman

Variable	n	Mean	SD	p
Systolic Blood Pressure (mmHg) :				
- Tobacco Chewers	50	154	41,65	0,0001
- Coconut Fronds Chewers	50	115,2	16,69	
Diastole Blood Pressure (mmHg)				
- Tobacco Chewers	50	82,6	6,94	0,001
- Coconut Fronds Chews	50	77,8	7,36	
Blood Sugar Levels (mg/dl) :				
- Tobacco Chewers	50	150,34	65,68	0,0001
- Coconut Fronds Chewers	50	121,66	67,27	

Table 2: Differences in Dental Health in Tobacco Chewers and Coconut Fronds Chewers of Karo Women

Dental Health	Mastication Tobacco		Mastication Coconut Fronds Shavings		p
	n	%	n	%	
Poorly	35	76,1	11	23,9	0,0001
Good	15	27,8	39	72,2	

PPKS Medan Laboratory had carried the laboratory tests on coconut frond shavings. The results are the coconut fronds are safe for consumption. Additionally, found that the compositions of coconut fronds are water (50.32%), ash (1.83%), oil (2.32%), protein (1.46%), carbohydrates (26.43%), crude fiber (29.42%) and calories (1.379 Kcal/kg).

Discussion

The preliminary aim of this study used a diagnostic action. From the data we found that systolic, diastolic blood pressure and blood sugar level of shaving coconut fronds chewers were less than tobacco chewers. It can indicate that the health status of chewers' tobacco is far worse than the health status of the chewers' shavings of coconut fronds. This research same as Bolinder research that found tobacco use has correlation with hypertension and statistically different with those who not used tobacco [17].

According to the composition of coconut fronds shavings in the Medan PPKS Laboratory the results of the examination showed that coconut frond shavings had a composition that was safe to use as a substitute for tobacco mastication. Almost not found in previous research related to tobacco substitutes in mastication. However, the authors found that previous studies related to the people who use a replacement nut and gambier [18]. Mastication coconut frond shavings is not a new thing for Karo

women. Therefore, coconut frond shavings are not a genuinely pure product discovered by the author. However, the author only documents the cultural practices that already exist in Karo women and seeks to encourage reactivation or revitalization of coconut fronds shavings as an alternative substitution to replace tobacco mastication. Coconut frond shavings are an innovation that the author found when conducting initial research on Karo women in Sembah Baru Village, Deli Serdang District, North Sumatra.

As a product, the actual stem of coconut shavings is not a new culture Karo woman, because it is already known since 40 years ago as a replacement of tobacco for Karo women mastication. The diffusion of innovation efforts that have taken place has been stagnant for a variety of reasons. Hopefully, this revitalization of coconut frond shavings can be carried out after this research. Socialization of Simple Coconut Fronds Shavings Technology was done by bringing an informant (Mak Leman) as the perpetrator of the coconut frond shavings from Sembah Baru Village, Pancur Batu District, Deli Serdang.

The author brought along Leman to socialize it to Karo women in Sukajulu Village how to use simple technology in shaving coconut midribs. Also carried out the practice of making coconut frond shavings, where shavings must be done slowly from top to

bottom in order to obtain long and not destroyed shavings. Shrinking techniques do not need to press so that the shavings are not too rough. Coconut fronds should be washed before planed to make sure the hygienist. After being shaved off, it is best to put the shavings in the plastic so that it remains moist and does not dry quickly.

If the shavings dry out, it will be crushed when consumed as mastication. Besides the practice of making coconut frond shavings, efforts were also made to use the appropriate communication channel so that socialization of the use of tobacco to switch to coconut frond shavings. In this action plan, the communication channels found were groups of peers and neighbours, supporting groups (traditional, religious, and village government figures) who played weddings, gatherings in churches, groups in coffee shops, meetings, and print media.

Peer groups are Karo women groups consisting of 2-5 peers who are accustomed to doing chanting and sharing activities. Usually, this peer group implements activity that can be based on several aspects of closeness, including (1) kinship closeness, (2) closeness of residence, (3) work/school proximity. Evidently, through this media, the screening process was running, so these groups had to get the first intervention.

Peer Educator training is an effort carried out by this research to train peers in promoting healthy mastication with coconut frond shavings. This Peer Educator training activity was carried out twice in Suka Julu Village, Barus Jahe District, Karo Regency. From the results of this training, a strong commitment to becoming an instructor was obtained to socialize firm health chew for Karo women.

As individuals, Karo women have status as children, as mothers, as wives, and as female friends, and with various public statuses in the community. With various statuses, Karo women can play their role in socializing coconut frond shavings through various communication channels [19]. A Group supporting healthy mastication is also needed.

These supporting groups consisted of traditional community leaders (toma), religious leaders (toga), and village administrations in Suka Julu Village and the

regional government from the Village to the district representatives. Various joint inputs are provided by the group supporting and ready to support. The supporting group also finally agreed that there would be land provided for coconut cultivation, and each house had already begun to plant coconut in their respective fields. At least 100 coconut trees were planted in the Sukajulu Village community land. After lengthy discussions and counseling, the author invited into small groups and carried out healthy mastication together.

Karo women try to use coconut frond shavings. All participants stated "agree" to adopt coconut frond shavings as an innovation for tobacco substitutes. Participants shared what he felt of activity using shavings of coconut fronds. Karo women feeling is essential to know the advantages related to the product so that there is willingness and commitment to adopt it replaces shavings of coconut fronds. Reasons to agree with are (1) because it has no side effects like tobacco sometimes makes the head dizzy, (2) Coconut coir is pleasant, there are no side effects and is healthy, (3) does not interfere with health, (4) does not make addicted and has no side effects, (5) does not contain nicotine, makes healthy body, (6) does not interfere with the heart and respiratory equipment, (7) does not cause diabetes and hypertension.

The healthy mastication participants stated that the use of coconut fronds could be tried first, provided the ingredients are available, and gradually. However, Karo women admit that they have not been able to stop using tobacco immediately, because they can go crazy, "can be full of mental hospitals" because they suddenly stop mastication tobacco suddenly or drastically. On average, participants who were present were willing to socialize to other chewers or the community, with evidence or ingredients, namely coconut fibers, could be available.

Residents are not only willing to plant coconut trees in their fields. However, jointly strive for the availability of coconut seeds. Then jointly planted 100 coconut stems in Sukajulu Village. Within 3-4 years, the brood can be used as a substitute for mastication tobacco. The enthusiasm of this community, especially the female Karo in Sukajulu Village, is worthy of appreciation.

It also shows the counselling process, exploring the input of citizen communication channels, healthy joint editing, peer training, simple technology socialization, relatively encouraging the acceleration of society towards the adoption of healthy mastication innovations. From the process of transferring this technology, the authors concluded that in the process of substitute coconut frond shavings, togetherness in good editing becomes an alternative to adopt healthy mastication quickly.

Moreover, it was found that the interest of Karo women in the techniques of making chew of coconut frond shavings was tremendous. Additionally, the use of Karo as an introductory language facilitates the process of delivering information to prospective adopters as well as accelerating

communication between extension agents and those who are in it.

Lastly, T the author finds that bringing together coconut frond chewers with prospective adopters increases interest and communication with prospective adopters to adopt healthy mastication. Escorting and accompanying policy advocacy efforts at the village, sub-district, and Karo levels in encouraging the results of this action research can be implemented jointly by the community. Capacity building and mentoring of community representatives, especially organized karo women and widespread publication of products produced in this research, films, brochures, leaflets, posters, journals, and books so that efforts to expand the idea of revitalizing healthy mastication in Karo women through coconut frond shavings can become increasingly widespread.

References

1. Remais J V, Zeng G, Li G, Tian L, Engelgau MM (2013) Convergence of non-communicable and infectious diseases in low- and middle-income countries. *Int. J. Epidemiol.*, 42(1):221-227. doi:10.1093/ije/dys135
2. Oni T, Unwin N (2015) Why the communicable/non-communicable disease dichotomy is problematic for public health control strategies: Implications of multimorbidity for health systems in an era of health transition. *Int. Health*, 7(6):390-399. doi:10.1093/inthealth/ihv040
3. World Health Organization (2014) Noncommunicable Diseases Country Profiles 2014. WHO Global Report.
4. Robinson HM, Hort K (2012) Non-communicable diseases and health systems reform in low-and-middle-income countries. *Pac. Health Dialog.*, 18(1):179-190.
5. Bhatt G, Goel S (2018) Using non-communicable disease clinics for tobacco cessation: A promising perspective. *Natl. Med. J. India*, 31(3):172-175. doi:10.4103/0970-258X.255763
6. Delobelle (2001) Commentary Big Tobacco, Alcohol, and Food and NCDs in LMICs: An Inconvenient Truth and Call to Action. 2019;(January 2001):1-5. doi:10.15171/ijhpm.2019.74
7. Lee CH, Chiang SL, Ko AMS, et al (2014) Betel-quid dependence domains and syndrome associated with betel-quid ingredients among chewers: An Asian multi-country evidence. *Addiction*, 109(7):1194-1204. doi:10.1111/add.12530
8. Heck JE, Marcotte EL, Argos M, et al (2012) Betel quid chewing in rural Bangladesh: Prevalence, predictors and relationship to blood pressure. *Int. J. Epidemiol.*, 41(2):462-471. doi:10.1093/ije/dyr191
9. Metgud R, Murugesh CJ, Shiva Kumar BN, et al. Prevalence, knowledge, and attitude of gutkha chewing among school children of Arsikere, India. *J. Cancer Res Ther.*, 2018;14(2):368-371. doi:10.4103/0973-1482.174532
10. Egbe CO, Londani M, Parry CDH, et al (2019) Tobacco use and nicotine dependence among people living with HIV who drink heavily in South Africa: a cross-sectional baseline study. - PubMed - NCBI. *BMC Public Health*. <https://www.ncbi.nlm.nih.gov/pubmed/31842834>. Published 2019. Accessed 19.
11. Hiler M, Breland A, Spindle T, et al (2017) Electronic cigarette user plasma nicotine concentration, puff topography, heart rate, and subjective effects: Influence of liquid nicotine concentration and user experience. *Exp. Clin Psychopharmacol.*,

25(5):380-392. doi:10.1037/pha0000140

December 19.

12. Gupta R, Gurm H, Bartholomew JR (2004) Smokeless tobacco and cardiovascular risk. *Arch. Intern. Med.*, 164(17):1845-1849. doi:10.1001/archinte.164.17.1845
13. Swan GE, Lessov-Schlaggar CN (2007) The effects of tobacco smoke and nicotine on cognition and the brain. *Neuropsychol Rev.*, 17(3): 259-273. doi:10.1007/s11065-007-9035-9
14. Martalena Br, S Kembaren (2019) Analysis Nicotine of Tobacco (*Nicotiana Tabacum*) Used as Chewing Tobacco and Effect of Consumption Events Low Birth Weight (Lbw) In the District Lau Baleng Karo DistrictNorth Sumatra. *JHSP*, 1(1):75-84.
15. Gondodiputro S (2019) Bahaya Tembakau dan Bentuk Sediaan Tembakau. <https://www.scribd.com/doc/142366268/EF-EK-ROKOK>. Published 2007. Accessed
16. Boyle P, Yasantha Ariyaratne M, Barrington R, et al (2006) Tobacco: deadly in any form or disguise. *Lancet*, 367(9524):1710-1712. doi:10.1016/S0140-6736(06)68747-3
17. Bolinder G, de Faire U (1998) Ambulatory 24-h blood pressure monitoring in healthy, middle-aged smokeless tobacco users, smokers, and nontobacco users. *Am J. Hypertens*, 11(10):1153-1163. doi:10.1016/s0895-7061(98)00137-x
18. Susiarti S (2005) The alternative choices of masticatory customs by local people in Wasur National Park, Merauke, Papua. *Biodiversitas, J. Biol. Divers.*, 6(3):217-219. doi:10.13057/biodiv/d060316
19. Shoemaker RE, Rogers EM *Communication of Innovations: A Cross Cultural Approach*. 15.