

The Influence of Parental Behavior on the Habits of Early Childhood Education in Consuming Betel Nut in West Timor Kupang



Christina Ngadilah¹, Leny M.A. Pinat², Merniwati Sherly Eluama³

^{1,2}Public Health, Health Polytechnic of the Ministry of Health Kupang Indonesia

³Health Promotion, Health Polytechnic of the Ministry of Health

INTRODUCTION

Consuming betel nut is a behavior that has been entrenched in Kupang Regency and even in East Nusa Tenggara Province. Culture is an abstract concept concerning the problem of social life which is a choice of a certain way of life and behavior patterns that are continuously displayed, maintained, displayed and developed as generation to generation (2) Consuming betel nut, especially in Kupang Regency, is actually strongly influenced by local culture, namely culture. "Oko Mama"(2). Elementary school children consume a lot of betel nut, around 80%, especially in a previous study in the village of Oelnaineno (2) The high consumption of betel nut in Kab. Kupang cannot be separated from cultural and family factors. There have been many studies that are connected between consuming betel nut with the development of babies in mothers who consume betel nut. One of the outcomes of pregnancy that has to do with consuming betel nut is low birth weight (LBW) babies. LBW is usually the condition of the baby who is short and weighs less. Such conditions will result in stunting children (3). Stunting is still a major health problem in Indonesia and even worldwide. Although stunting cases in certain countries have started to decline, in Indonesia this case is being discussed by health experts. Low nutrition is closely related to stunting, wasting, low birth weight and anemia. Malnutrition in children is a significant problem in Indonesia; stunting conditions, low body weight, and very thin children (wasting) continue to affect children under five. Stunting reflects chronic malnutrition and can have long-term impacts, including stunted growth, decreased cognitive and mental abilities, susceptibility to disease, low economic productivity, and low quality of reproductive output. Wasting is the result of acute malnutrition and high frequency of illness in children; This condition increases the risk of child mortality significantly. Stunting and wasting occurs because children do not get proper or appropriate nutrition at all stages of their lives. This condition can have significant implications for the health and survival of children in the long term as well as Indonesia's economic productivity and the nation's ability to achieve its national and international development targets.(4) Research in 2018 in Indonesia found that 29.9 percent of children under the age of 24 months were stunted. Stunting rates vary significantly between regions; The highest prevalence of stunting is found in the western and easternmost regions of Indonesia and is more widespread in rural areas than urban areas. Further research found that the stunting rate even reached 42 percent in several parts of Indonesia. It is even an important note by UNICEF that 1 in 3 children under five in Indonesia is stunted (4). Furthermore, UNISCEF underlined that about 10% of babies born in Indonesia have low birth weight, this indicates the presence of malnutrition in the mother.

Chewing betel nut is an ancient culture in Timor and many other places in East Nusa Tenggara to this day. In this modern era, the practice of consuming betel nut is rarely found in the view of modern people, consuming betel nut looks less clean, and usually they throw their red saliva in any place, even in parks which reduce the beauty of the scenery. In addition, in this era of covid, throwing away carelessly will have a very big impact on the spread of covid 19, because consuming betel nut will experience hypersalivation, so that you throw up saliva continuously. Concerns have been expressed that the frequent excessive salivation caused by chewing betel nut poses a health hazard to the environment. Saliva may contain bacterial and viral material, making it a means of disease transmission. Tuberculosis, a bacterial infection transmitted by inhalation of infected particles, is common in many places. Control of spitting and coughing in an infected person is advised to minimize the possibility of disease transmission. As a result, excess saliva chewing betel nut can be a significant means of transmission in areas with a high prevalence of areca nut use and tuberculosis infection. In addition to being a carcinogen, areca nut also causes various degenerative diseases, as well as diseases in the mouth (5) The habit of consuming betel nut usually starts from childhood, and it

The Influence of Parental Behavior on the Habits of Early Childhood Education in Consuming Betel Nut in West Timor Kupang

is believed that habits that start from childhood will lead to adulthood and later appear a a habit that is difficult to control because of the addictive nature of betel nuts (5). The behavior of consuming betel nut is influenced by culture (6) while human life in modern society in the global era is always vulnerable to the inevitable process of social change. Indigenous peoples are also vulnerable to change, especially to things that make life better, but the values certain values that become their identity and identity that have been preserved for generations are not destroyed (1)

The most basic education is PAUD (Early Childhood Education). In early childhood education, character education is taught to children. Children usually imitate adults a lot at this age. Research objectives:1. Analyzing the relationship between consuming betel nut in PAUD children and consuming betel nut in parents. s 4. Exploring the habit of consuming betel nut in early childhood children Kab. Kupang

METHOD

The population of PAUD children from 100 PAUD under UNICEF's care from 24 sub-districts ranged from 2400 and using a statistical cross-sectional study with stratified random sampling was carried out to explore the influence of parents on the habit of consuming betel in PAUD children in Kupang Regency. The sample consists of 10 PAUDs in Kupang Regency with details in the Amfoang 2 PAUD Fatuleu 2 PAUD area, the Amabi Oefeto area 2 PAUD and the Amarasi area there are 2 PAUD.. The average number of students for 1 PAUD is around 15-20 people. It is estimated that the total sample of 4 PAUD representing 24 sub-districts in Kupang Regency is 200 to 300 people. The criteria for PAUD are those that include UNICEF care and have mentors in each sub-district. The self-reported questionnaire was filled out anonymously by parents of active PAUD children as a sample. The inclusion criteria for PAUD children are attending 100 PAUD under the care of Unicef and New Zealand aged between 4-6 years, male and female students and their parents consuming betel nut or not consuming betel nut.

Researchers will measure behavior by first measuring attitudes, subjective norms, Percieved Behavior Control and knowledge of respondents. Then the intention is also measured which will affect the behavior in consuming betel nut. The PAUD children were asked about 1. Frequently consuming betel nut, 2. Rarely consuming betel nut and 3. Ever trying to consume betel nut and 4. Never. In compiling the questionnaire researchers used Constructing Questioners Based on The Theory of Planned Behaviour A Manual for Health Services Researchers (19)

RESULT

Frequency Distribution of Respondents by Gender

| Gender | Frequency | Percent |
|--------|-----------|---------|
| Male | 94 | 45.9 |
| Female | 111 | 54.1 |
| Total | 205 | 100.00 |

Frequency Distribution of Respondents by Occupation

| Occupation | Freuency | percent |
|---------------------|----------|---------|
| Housewife | 23 | 11.2 |
| Farmer | 148 | 72.2 |
| Government employee | 8 | 3.9 |
| Private employee | 5 | 2.4 |
| Other | 21 | 10.2 |
| Total | 205 | 100.00 |

Level Education of Respondent

| Education | Frequency | Percent |
|--------------------|-----------|---------|
| No School | 20 | 9.8 |
| Primary School | 100 | 48.8 |
| Junior High School | 26 | 12.7 |
| Senior High School | 49 | 23.9 |
| Diploma/Bachelor | 10 | 4.9 |
| Total | 205 | 100.00 |

The Influence of Parental Behavior on the Habits of Early Childhood Education in Consuming Betel Nut in West Timor Kupang

Frequency Distribution of Respondents by Age

| Age Group | Frequency | Percent |
|-----------|-----------|---------|
| 17-25 | 44 | 21.5 |
| 26-35 | 50 | 24.4 |
| 36-45 | 58 | 28.3 |
| 46-55 | 53 | 25.9 |
| Total | 205 | 100.0 |

Crosstab Between Parents and Children Who chewing Betel Nut

| | | children | | Total |
|--------|------------|------------|---------|-------|
| | | No chewing | chewing | |
| Parent | No chewing | 34 | 5 | 39 |
| | chewing | 2 | 164 | 166 |
| Total | | 36 | 169 | 205 |

Correlation Test Results Between Parents and Children Who Chewing Betel Nut

| Spearman's rho | | | Parent | Children |
|----------------|-------------------------|--|--------|----------|
| Parent | Correlation coefficient | | 1.000 | .887** |
| | Sig. (2-tailed) | | | .000 |
| | N | | 205 | 205 |
| Children | Correlation coefficient | | .887** | 1.000 |
| | Sig. (2-tailed) | | .000 | |
| | N | | 205 | 205 |

** . Correlation is significant at the 0.01 level (2-tailed).

DISCUSSION

Betel nut is consumed by both men and women. In Timor, it is the same as elsewhere, including in Bhutan (Wangdi and Jamtsho, 2020), in Mehrtash et al., 2017; Pratt 2015; From Table 1, female betel nut consumption is more than male, this is contrary to research from Wasir et al., 2016 Myint et al, 2016 that the prevalence of males is greater than females. Likewise, research by Kumar et al (2021) in Guwahati, Assam, India, the majority of betel nut consumers are male. The current research is supported by past research (Flora et al., 2012; Ghani et al., 2011; Heck et al., 2012, Wangdia and Jamtsho 2020) that more women consume betel nut. Meanwhile, according to Myint et al (2016) that the factors that are significantly related to consuming betel nut is the male sex dominates in terms of consuming betel nut. Usually, betel nut consumers also consume alcohol and have low education and even no education. As in this study, most of the betel nut consumers had elementary education or did not graduate from elementary school, followed by junior high school graduates

In this study there is a very striking difference, especially in the start of learning to consume betel nut, which has started since early education (PAUD), while other researchers have started consuming betel nut since Primary School, Junior High School or even Senior High School or some have started consuming betel nut since Primary School. marry. Such as research by Mora et al 2007 which states that betel nut consumers learn to consume betel nut in their late teens and some start consuming betel nut at the age of 10 years and adopt betel nut consumption in their parents and peers. In this study, children learned to consume betel nut since early education, some even as young as 1 year old were given betel quid (a mixture of betel nut which was chewed by the mother and then put into the child's mouth). This is a new finding from this study. Meanwhile, regarding the work of betel nut consumers, they are farmers and housewives. Research by Huang et al, (2020) that most of the betel nut consumers are drivers. According to the researcher's statement, the use of betel nut seems to have decreased compared to the

The Influence of Parental Behavior on the Habits of Early Childhood Education in Consuming Betel Nut in West Timor Kupang

previous years, both in 2009 and 2013. While in this study, according to the data, there seems to be no sign of a decrease in prevalence due to where parents consume betel nut, their children also consume betel nut. As many as 82.4% of parents consume betel nut and as many as 83.3% of their children consume betel nut either regularly, sometimes sometimes or have tried it, however, children who consume betel nut regularly mostly if their parents are consuming betel nut then their children also will follow the consumption of betel nut. In the data above, there is an increase in the next generation. Research at USAPI (US Affiliated Pacific Island) by Dalisay et al,(2019) that most of the influence of consuming betel nut comes from parents and siblings. According to Paulino et al., 2017 in Guam it was found that the prevalence of consuming betel nut continues to increase from year to year, 48% of young people consume betel nut both men and women while parents as much as 46% consume betel nut both men and women. In this study, almost all ages consume betel nut if it is seen that children under 5 years old (PAUD children) also consume betel nut, while those aged between 36-45, namely 28.3%, are the most consumed, followed by age 46-55, which is 25.9%. Only a few betel nut consumers added tobacco when consuming betel nut in this study. In the research of Narayanan et al (2019), almost all ages consume betel nut and most of the betel nut consumers add tobacco when consuming betel nut. Cancer is the second most common cause of death for Americans, which is why cancer is the focus of public health efforts (CDC, 2017). According to WHO (2020) that Indonesia has 396 914 cancer cases and 234,511 deaths from cancer, including oral cancer, lung cancer and breast cancer the most. Areca nut has been designated by WHO (2012) as a class 1 carcinogen, meaning that the substances, mixtures and exposure conditions in this list have been classified as group 1 by the International Agency for Research on Cancer (IARC/International Agency for Research Cancer). In past research (Ngadilah, 2019) that most betel nut consumers misperception about the dangers of betel nut for health, both general health and oral health, especially oral cancer, while research in the Northern Mariana Islands by Narayanan et al (2020) stated that most of the betel nut consumers betel nut does not know or misperceptions about the dangers of betel nut for Oral Health, especially betel nut causes oral cancer, even certain ethnic groups totally disagree that areca nut causes oral cancer. In this study, in the questionnaire analysis, almost all respondents did not agree that betel nut causes oral cancer. Meanwhile 80% of Bangladeshi women and men living in London are aware of the dangers of smoking but only 24% of men and 36% of women are aware that betel nut is a carcinogen (Narayanan, et al 2020 cit. Ahmed 1997). Other findings indicate that exposure to cyanotoxin through chewing betel nut can contribute to oral cancer in the habit of chewing betel nut and is suspected to be associated with liver cancer (Hernandez, 2021). According to Khasbage et al (2021), that there is a relationship between consuming betel nut with an increase in liver disease. In previous studies, it was also found that there was a relationship between consuming betel nut and an increase in cirrhosis hepatitis.

From the statistical test results of the relationship between the behavior of parents and the behavior of PAUD children who consume betel nut, there is a significant relationship between the behavior of parents who consume betel nut with the behavior of children with a significance of $p < 0.05$. INTERGENERATION SECOND GENERATION AND THIRTH GENERATION DISCUSSION Seeing both the cases, enamel craze fractures and staining the primary teeth were the most common clinical findings seen. Our second patient though agreed for discontinuing the habit; no such positive attitude was seen in first case. Both the cases, family members, were the main source for the initiation of the habit. Parents started this owed to wrong conceptions prevalent about the positive effects of areca nut chewing. In both the cases, we found that parents were reluctant to render the exact habit history knowing that it's a social stigma., In terms of reducing the prevalence of children consuming betel nut, besides educational institutions, parents, community, mass media including Social Media, can be involved in a multi-faceted intervention program for curbing this habit (Snigdha, 2021). Meanwhile widowati (2020) researching the use of betel nut as a cure for various diseases in Indonesia

According to Fang Yen et al (2016) that longer duration of paternal betel quid chewing and smoking, prefatherhood, independently predicted early occurrence of incident MetS in offspring, corroborating previously reported transgenerational effects of these habits, and supporting the need for habit-cessation program provision.

CONCLUSION

The behavior of consuming betel nut is significantly related to the parental effect on early education school children in Kupang Regency. In fact, this shows that there is a significant intergenerational influence of parents' behavior on their children's behavior in terms of consuming betel nut. To curb this rising stigma, awareness about the habit through Health education has to be imparted.

ACKNOWLEDGEMENT

We would like to say thank you to Directur Poltekkes Kemenkes Kupang who give us opportunity to do this research.

The Influence of Parental Behavior on the Habits of Early Childhood Education in Consuming Betel Nut in West Timor Kupang

REFERENCES

- 1) Flora, S. M., Mascie-Taylor, C. G. N., & Rahman, M. (2012). Betel quid chewing and its risk factors in Bangladeshi adults. *WHO South-East Asia Journal of Public Health*, 1(2),169-181.
- 2) Ghani, W. M., Razak, I. A., Yang, Y.-H., Talib, N. A., Ikeda, N., Axell, T. ... Zain, R. B. (2011). Factors affecting commencement and cessation of betel quid chewing behaviour in Malaysian adults. *BMC Public Health*, 11(1), 82. doi:10.1186/1471-2458-11-82
- 3) Heck, J. E., Marcotte, E. L., Argos, M., Parvez, F., Ahmed, A., Islam, T. Chen, Y. (2012). Betel quid chewing in rural Bangladesh: Prevalence, predictors and relationship to blood pressure. *International Journal of Epidemiology*, 41(2), 462–471. doi:10.1093/ije/dyr191
- 4) Kinley Wangdia,b and Tshering Jamtsho (2020): "Prevalence and Correlates of Betel Quid Chewing among Bhutanese Adults" 2020, VOL. 55, NO. 9, 1443–1449 <https://doi.org/10.1080/10826084.2019.1673416>
- 5) Sartaj Singh Wasir, Pallak Arora, Shalini Kapoor, Jayam Raviraj (2016):" Prevalence of areca nut chewing habit among high school children of Parsa district of Nepal" *Journal of Oral Biology and Craniofacial* November 2016.
- 6) Ashok Khandelwal, Vishal Khandelwal,¹ Mainak K. Saha,² Sushma Khandelwal,³ Sai Prasad,⁴ and Suparana G. Saha⁵ (2012) : " Prevalence of areca nut chewing in the middle school-going children of Indore, India' , [Contemp Clin Dent](#). 2012 Apr-Jun; 3(2): 155–157.
- 7) [Su Kyaw Myint](#), [Kulaya Narksawat](#), [Jutatip Sillabutra](#) (2016):" Prevalence And Factors Influence Betel Nut Chewing Among Adults In West IN Township, Yangon, Myanmar "Southeast Asian J Trop Med Public Health . 2016 Sep;47(5):1089-97.
- 8) Author links open overlay panel [Su-ChenWang^{ab}](#)[Chi-ChengTsaiMD^a](#) [Shun-TeHuangMD^a](#)[Yu-JueHongPh.D^c](#) (2004):" Betel nut chewing: the prevalence and the intergenerational effect of parental behavior on adolescent students [Journal of Adolescent Health Volume 34, Issue 3](#), March 2004, Pages 244-249
- 9) Alejandra Nuñez-de la Mora, Fahmida Jesmin, Gilliant betley (2007):"Betel Nut Use Among First and Second generation Bangladesh Women in London ,UK *Journal of Immigrant and Minority Health* · November 2007
- 10) Yu- Ting Huang, Pei -Shan Ho, Yann- Yuh Jou, Chien Yuan Hu, Ying-Wei Wang, Yi-Shin Yang (2020):"Determining High Prevalence of Betel-Quid Chewing and Cigarette Smoking by Occupation Using the Taiwan National Health Interview Survey" <https://doi.org/10.1080/10826084.2020.1732421>; *Substance Use and Misuse Journal* Homepage
- 11) [Francis Dalisay](#), PhD, [Wayne Buente](#), PhD, [Chantay Benitez](#), B.A., [Thaddeus A. Herzog](#), PhD, and [Pallav Pokhrel](#), PhD Adolescent betel nut use in Guam: beliefs, attitudes and social norms' [Addict Res Theory](#). Author manuscript; available in PMC 2020 Jan 11
- 12) Centers for Disease Control and Prevention. (2016). Cancer control in the U.S. affiliated Pacific Islands. Retrieved from <http://www.cdc.gov/cancer/ncccp/usapi.htm>.
- 13) A. Blythe Ryerson, PhD, MPH¹; Greta M. Massetti, PhD¹ ([View author affiliations](#) (2017):" Centers For Disease Control (2017):"CDC's Public Health Surveillance of Cancer" SPECIAL TOPIC — Volume 14 — May 18, 2017
- 14) Paulino YC, Hurwitz EL, Ogo JC, Paulino TC, Yamanaka AB, Novotny R, Wilkens LR, Miller MJ, & Palafox NA (2017). Epidemiology of areca (betel) nut use in the mariana islands: Findings from the University of Guam/University of Hawaii cancer center partnership program. *Cancer Epidemiology*, 50, 241–246. [[PMC free article](#)] [[PubMed](#)] [[Google Scholar](#)]
- 15) Hernandez BY, Biggs J, Zhu X, Sotto P, Nagata M, Mendez AJP, Paulino Y.(2022) : "Environmental Exposure to Cyanobacteria Hepatotoxins in a Pacific Island Community: A Cross-Sectional Assessment. . *Microorganisms Journal* 2022 Aug 9;10(8):1607. doi: 10.3390/microorganisms10081607. PMID: 36014026 Free PMC article.
- 16) Dalisay F, Pokhrel P, Buente W, Kawabata Y (2022):" [Exposure to tobacco and betel nut content on social media, risk perceptions, and susceptibility to peer influence among early adolescents in Guam](#). *Addict Behav Rep*. 2022 Jan 3;15:100405. doi: 10.1016/j.abrep.2021.100405. eCollection 2022 Jun. PMID: 35434250 Free PMC article.
- 17) Paulino YC, Ada A, Dizon J, Benavente EJ, Campbell KML, Cristobal B, Daughtry A, Estabillo LMO, Flisco VDC, Badowski G, Hattori-Uchima M. [Development and evaluation of an undergraduate curriculum on non-communicable disease research in Guam: The Pacific Islands Cohort of College Students \(PICCS\)](#). *BMC Public Health*. 2021 Nov 3;21(1):1994. doi: 10.1186/s12889-021-12078-9. PMID: 34732169 Free PMC article.
- 18) Cash HL, De Jesus S, Durand AM, Tin STW, Shelton D, Robles R, Mendiola AR, Brikul S, Ipil M, Murphy M, Hunt LSS, Nielsen Lesa F, Sigrah CA, Waguk R, Abraham D, Kapiriel SF, Camacho J, Chutaró E. (2021):"Hybrid Survey' approach to non-communicable disease surveillance in the US-Affiliated Pacific Islands." *BMJ Glob Health*. 2021 Oct;6(10): e006971. doi: 10.1136/bmjgh-2021-006971. PMID: 34706881 Free PMC article.

The Influence of Parental Behavior on the Habits of Early Childhood Education in Consuming Betel Nut in West Timor Kupang

- 19) Hernandez BY, Zhu X, Sotto P, Paulino Y (2021):" [Oral exposure to environmental cyanobacteria toxins: Implications for cancer risk.](#)" Environ Int. 2021 Mar; 148:106381. doi: 10.1016/j.envint.2021.106381. Epub 2021 Jan 19. PMID: 33465665 Free PMC article
- 20) Centers for Disease Control & Prevention (CDC). (2017). High School Youth Risk Behavior Survey: Guam 2017 Results. Accessed July 17, 2018, at <https://nccd.cdc.gov/youthonline/App/Results.aspx?LID=GU>
- 21) World Health Organisation (2020) ;" International Agency for Research on Cancer, Indonesian Globocan 2020" <https://gco.iarc.fr/today/data/factsheets/populations/360-indonesia-fact-sheets.pdf>.
- 22) Ajay M. Narayanan BSA; Ahana Yogesh BA, Mary P. Chang, RK. Orosco, Andrey Finegersh, William Moss (2020):"A Survey of Areca (Betel) Nut Use and Oral Cancer in the Commonwealth of the Northern Mariana Islands" : <https://www.researchgate.net/publication/340923894>, HAWAI'I JOURNAL OF HEALTH & SOCIAL WELFARE, APRIL 2020, VOL 79, NO 4
- 23) Ahmed S, Rahman A, Hull S. (1997):" Use of betel quid and cigarettes among Bangladeshi patients an inner-city practice: prevalence and knowledge of health effects. British Journal of General Practice. 1997; 47:431-434
- 24) [Ajay M Narayanan](#)¹, [Andrey Finegersh](#)², [Mary P Chang](#)³, [Joanne Ogo](#)⁴, [Ryan K Orosco](#) , [William J Moss](#)-The profound oral cavity cancer burden in the United States Commonwealth of the Northern Mariana Islands: A global health opportunity" Am J Otolaryngol . 2019 Nov-Dec; 40(6):102267. doi: 10.1016/j.amjoto.2019.07.011. Epub 2019 Jul 19
- 25) [Arvind Kumar](#)—, [Kunal Oswal](#), [Ravikant Singh](#)—, [Neha Kharodia](#) , [Akash](#) , [Pradhan Pradhan](#), [Lakshman Sethuraman](#)⁻¹, [Ramachandran Venkataramanan](#) , [Arnie Purushotham](#) (2021) ; -Assessment of areca nut use, practice and dependency among people in Guwahati, Assam: a cross-sectional study" Ecancermedalscience . 2021 Mar 4;15:1198. doi: 10.3332/ecancer.2021.1198. eCollection 2021.
- 26) [Suwarna B Dangore Khasbage](#), [Rahul R Bhowate](#), [Nazli Khatib](#) (2021): -Risk of liver disease in areca nut habitual: A systematic review" Journal Oral Maxillofac Pathol . 2022 Jan-Mar;26(1):128-129. doi: 10.4103/jomfp.jomfp_345_21. Epub 2022 Mar 31.
- 27) Grace Hui-Min Wu 1, Barbara J Boucher2,, Yueh-Hsia Chiu , Chao-Sheng Liao 3 and Tony Hsiu-Hsi Chen (2008):" Impact of chewing betel-nut (Areca catechu) on liver cirrhosis and hepatocellular carcinoma-: a population-based study from an area with a high prevalence of hepatitis B and C infections" Article in Public Health Nutrition · May 2008.
- 28) Snigdha Shrabani, [Tavleen Bajwa](#), Shaubhik Anand, Lalik Mohan (2021):' Cross-sectional Study on Prevalence of Betel Nut Chewing among the Youth of Meghalaya, North East Region of India: Development of Multifaceted Prevention Strategy" uly 2021 [Asian Pacific Journal of Tropical Biomedicine](#) 8(3):185- 190 DOI:[10.21276/apjhs.2021.8.3.32](https://doi.org/10.21276/apjhs.2021.8.3.32)
- 29) [Amy Ming-Fang Yen](#), [Barbara J. Boucher](#), [Sherry Yueh-Hsia Chiu](#), [Jean Ching-Yuan Fann](#), [Sam Li-Sheng Chen](#), [Kuo-Chin Huang](#) and [Hsiu-Hsi Chen](#) (2016):' Longer Duration and Earlier Age of Onset of Paternal Betel Chewing and Smoking Increase Metabolic Syndrome Risk in Human Offspring, Independently, in a Community-Based Screening Program in Taiwan" <https://doi.org/10.1161/CIRCULATIONAHA.116.021511> Circulation. 2016; 134:392–404
- 30) Lucie Widowati, Lestari Handayani Rochmad Muhajid (2020)" The use of betel (Piper betle) leaves for maintaining the health of women and children at various ethnic groups in Indonesia" Nusantara Biocience [Vol. 12 No. 2 \(2020\)](#)



There is an Open Access article, distributed under the term of the Creative Commons Attribution–Non Commercial 4.0 International (CC BY-NC 4.0) (<https://creativecommons.org/licenses/by-nc/4.0/>), which permits remixing, adapting and building upon the work for non-commercial use, provided the original work is properly cited.