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Barriers to quitting areca nut consumption and joining a cessation program as perceived by chewer and nonchewer populations in Guam.

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Abstract

Background: Areca nut (AN) is a carcinogenic substance consumed by roughly 600 million individuals worldwide with increasing popularity in Guam. In response, a cessation program was developed and implemented in Guam and Saipan. However, to improve its delivery, it is necessary to understand the reasons influencing recruitment and participation, such as why a chewer may not want to quit or join a cessation program.

Objective: To explore barriers inhibiting chewers from quitting AN chewing and from participating in a cessation program.

Methods: Nine individual and group discussions were facilitated with a convenience sample of 17 chewers and nonchewers in Guam in 2017. The mean age of the participants was 36.4 years. Recurring themes relating to reasons for not quitting and not joining a cessation program were extracted.

Results: Results produced 3 general categories – Sociocultural, Behavioral, and Accessible. Each category encompasses different attributes concerning reasons not to quit chewing (e.g. addiction, enabling community, or belief that AN is harmless), and reasons influencing lack of participation in a cessation program (e.g. time, transportation, or relatability).

Conclusions: Current findings suggest chewers are unaware of the harmful effects of AN. Also, they may not comprehend the purpose of a cessation program. In addition, the likelihood of chewers participating in a cessation program is influenced by their level of comfort with the program and personnel, and whether a program addresses their time and transportation limitations.

Keywords

areca (betel) nut; cessation program; quitting; barriers

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Introduction

Areca nut (AN), commonly referred to as betel nut, is a fruit produced from the *Areca catechu* palm and chewed by roughly 600 million individuals worldwide including populations in the Western Pacific region such as Guam (Boucher & Mannan, 2002; Gupta & Warnakulasuriya, 2002). It may be chewed alone or in a "betel quid" comprised of the nut plus additives such as slaked lime, *Piper betle* leaf, and/or tobacco (International Agency for Research on Cancer [IARC], 2004). The local red and white varieties harvested in Guam are typically preferred by Chamorro chewers. The imported green varieties, colloquially known as "Yapese betel nut", are preferred by Chuukese, Palauan, and Yapese chewers, and are usually purchased at small markets (Paulino, Novotny, Miller, & Murphy, 2011). In the present manuscript, "AN" will be used to reference both the nut and the betel quid.

In Guam, the 5-year AN chewing prevalence is 11%, and increases in usage were seen among non-Chamorros from 7% in 2011 to 13% 2015 (Paulino et al., 2017). Chewing has also become increasingly popular among the youth throughout Micronesia. One study found that among 7th and 8th grade adolescents in Yap and Pohnpei, 61.5% and 71.4%, respectively, reported ever using AN (Milgrom, Tut, Gilmatam, Gallen, & Chi, 2013). In the Commonwealth of the Northern Mariana Islands, 63.4% high-school students reported regular use of AN (Oakley, Dermaine, & Warnakulasuriya, 2005).

Numerous studies have measured the effects of AN on the human body. Perhaps most concerning is the association detected between AN and oropharyngeal cancer (Sharan, 1996; Sharan, Mehrotra, Choudhury, & Asotra, 2012). In 2004, AN chewing with or without tobacco was classified as carcinogenic (IARC, 2004). Other effects have also been reported. For example, *Arecoline*, the principal alkaloid found in the nut, contains parasympathetic properties that affect the central and autonomic nervous systems, often leaving its users to experience a sense of euphoria and dependency (Chu, 2001; Chu, 2002). Consuming AN has also been deemed as a risk factor for coronary artery disease (Khan et al., 2013).

To address the rising health concerns surrounding AN chewing, the Betel Nut Intervention Trial ("BENIT", ClinicalTrials.gov ID: NCT02942745), the first known randomized trial aimed at AN chewing cessation, was recently implemented in Guam and Saipan. The BENIT study targets Class 2 chewers - AN chewers who include tobacco. To improve delivery of cessation programs such as BENIT, it is necessary to understand recruitment and participation challenges, beginning with identifying reasons a chewer may not want to quit or join a AN cessation program. Reasons for beginning and continuing AN chewing are well known (Ghani et al., 2011; Little et al., 2014a; Little et al., 2014b; Murphy, Liu, & Herzog, 2017; & Paulino et al. 2011); however, there is little documentation on why a chewer may not want to quit or join a AN cessation program. Choosing not to join a cessation program is likely to involve additional factors that were not previously explored.

Therefore, the purpose of the current study is to explore the barriers inhibiting chewers from quitting AN chewing and from participating in a cessation program.

Methods

Study participation and recruitment

A convenience sample of self-reported chewers and nonchewers, aged 18 years or older, and living in Guam, were recruited between July 2017 and September 2017. Recruitment relied primarily on distribution of flyers via social media and by word of mouth. Recruiters were research assistants affiliated with the BENIT study and familiar with the cultural appropriateness of recruiting AN chewers. Paulino et al. (2011) highlights the importance of AN in some communities, thus, it was anticipated that nonchewers would provide less resistance when queried about AN cessation. Nonchewers were also anticipated to provide additional insights into promoting AN cessation efforts. For this reason, nonchewers were required to have frequent exposure to chewers. Determination of frequent interactions were self-reported and verbally obtained. Informed consent was obtained prior to participation. Ethical approval for this study was obtained by the University of Guam Committee on Human Research Subjects.

Interviews—Key informant and group interviews were conducted. Interviewers were research assistants of the BENIT study who have undergone extensive training in tobacco cessation facilitation. The training was hosted by the Guam Department of Public Health and Social Services Tobacco Prevention and Control Program and the U.S. Naval Hospital Guam Health Promotion Section. The research assistants were also aware of the cultural sensitivity of AN usage among different ethnic groups.

A total of 5 semi-structured questions were generated by the study staff, including the Project Investigator, and were aimed at prompting discussion regarding reasons why a chewer may not want to quit and/or join a cessation program (Table 1). The questions were adapted to chewers and nonchewers. For example, chewers were asked “What is it about betel nut chewing that makes you want to continue to chew?” whereas nonchewers were asked “What is it about betel nut chewing that you think makes betel nut chewers continue to chew?” Additional probes were provided to initiate discussion (Table 1). Because some chewers may feel stigmatized while socializing with nonchewers (Paulino et al., 2011), the two groups were separated during the interviews. In addition, interview groups were to be separated based on gender due to the effect that gender roles may have on content output (Paulino et al., 2011). All interviews were recorded to monitor interview quality. Participant documents and audiotapes were securely stored for data analysis. Participants were compensated with $20 gift cards at the end of the interviews for their time and effort.

Data analysis

Research staff involved with the facilitation of the interview participated in the extraction of recurrent themes. Extraction involved identification of topics discussed throughout the interviews and association of those topics based on conceptual similarities. Recurrent themes were then consolidated and grouped into overarching categories. Descriptive statistics were performed on age and ethnicity data using Microsoft Excel 2013.

Results

Study participants

Seventeen participants were enrolled in the study. Eleven participants were chewers (5 males/6f females), and 6 were nonchewers (all female). Ages ranged from 19 to 60 years old (mean±sd = 36.4±12.4yrs). All chewers were Yapese, while nonchewers consisted of Chamorro, Chuukese, Filipino, and Caucasian ethnicities. Interviews were conducted at varying locations including the participants' home and the institutions conference room. Interviews ranged from 10 to 40 minutes in length.

Categories of influence

Table 2 represents sample excerpts from chewers and nonchewers corresponding to reasons why a chewer may not want to quit. These reasons were grouped into 3 categories (Sociocultural, Behavioral, and Accessibility), two of which were also evident in reasons why a chewer may not join a cessation program, listed in Table 3.

Sociocultural

Sociocultural influence refers to the interactions between an individual and members of their community, and to the beliefs and attitudes that manifest through socialization and cultural relativity (Williams, Malik, Chowdhury, & Chauhan, 2002). Examples include the belief that AN is harmless, that the chewer will not develop oral cancer, or that a chewer requires no formal guidance to quitting. Participants discussed how chewing is an expected part of social interaction in many communities. Many suggested that chewers often find themselves chewing amongst friends, families, and other social groups. For example, one nonchewer reported, "they grew up where everyone's chewing. It's hard not to follow them." Likewise, chewers reported, "if you gather around with your friends or family, they take out their chew. You sit there [thinking] I already quit, but I just want to join. Just this time." Thus, the practice of chewing AN yields a feeling of camaraderie and is usually offered as a welcoming into a social group or for stimulating conversation.

Nonchewers introduced the concept of relatability. This may be interpreted as the hesitation of a chewer to join the program without knowing the personnel involved. Nonchewers discussed how chewers would be more motivated to participate in cessation programs advocated by former chewers – those who have experience chewing and know the difficulties of quitting. Nonchewers also believed that chewers who are familiar with the facilitators of a cessation program might be more inclined to attend.

Behavioral

Behavioral influence refers to the sensations experienced while chewing AN and the actions in response to these sensations. Chewers reported that AN helped them function throughout the day, with AN providing a sense of euphoria, being alert and attentive, and feeling relaxed while chewing.

Behavioral factors also include the habitual and addictive nature of AN. Habits define the pattern of consumption that is routinely consistent. For example, chewers in the study

routinely fixed their AN upon waking up in the morning, or shortly after meals. This behavior is based on an established pattern that does not invoke a sense of high dependency. Addiction, however, refers to the compulsive desire to chew, leading to sporadic engagements that are difficult to stop. Participants explicitly stated that chewers are addicted to AN, or implied that some chewers are highly dependent on the nut. As stated from a chewer, “It’s like an addiction. Once you get the taste of it, it’s hard for you to quit [chewing].”

Accessibility

Accessibility refers to the relative ease of obtaining and chewing AN, the lack of available information pertaining to the detrimental effects of chewing AN, and the difficulty of attending cessation programs. Concepts incorporated under this category include a lack of awareness and understanding of both AN and the cessation program. Both chewers and nonchewers suggested that many individuals are simply unaware of the harmful effects of AN. For example, one chewer reported, “You see a lot of advertisements in anti-smoking, but I don’t see advertisements on anti-chewing.”

Lack of demand for an AN cessation program was also mentioned. Chewers report, “I can stop anytime I want because when I was in the military, we don’t chew betel nut. So I stopped and nothing.” It was also suggested that some chewers may not comprehend the purpose of a cessation program, or what a cessation program entails. Nonchewers agreed that, “Some [chewers] can only understand [at an] elementary level. They might not understand what cessation means.”

Contrary to the accessibility and convenience of the nut, participants noted inconvenient factors associated with joining a cessation program; specifically, time and transportation challenges.

Discussion

To effectively deliver cessation programs, it is essential to understand possible recruitment and participation challenges. Research in AN cessation is still in its nascent stages, therefore, the barriers inhibiting a chewer from quitting or from joining a cessation program was unknown. This study explored these barriers, and derived major issues relevant to AN chewers in Guam.

Sociocultural relevance plays a paramount role in a chewers’ perception of AN as conventional. The use of AN as a means of socialization fosters the idea that the practice is normal and acceptable. Paulino et al. (2011) found that Chamorro, Palauan, and Yapese chewers are proud of the practice as it promotes social stimulation. Additionally, they intend to continue the practice by passing it onto future generations. The ideologies that manifest as a result of such communal upbringing are an obstacle for disseminating information regarding AN and the cessation program. Some beliefs are generated through observation of other chewers. It is known that AN chewing is linked to oral cancer and other oral premalignant lesions (Garg, Chaturvedi, & Gupta, 2014; Trivedy, Craig, & Warnakulasuriya, 2002). Although some chewers may be aware of such effects, this study found that chewers

often believe they are immune to those effects (Table 3). This is consistent with Quinn Griffin, Mott, Burrell, and Fitzpatrick (2014), who found that AN chewing was done regardless of whether health risks are known. In the current study, several participants reported knowledge of older adults who have chewed their entire lifetime and have not developed oral cancer, creating the perception that AN is harmless. For some chewers, this might encourage the belief that AN is more beneficial than harmful. Other observations refer to the distinction between those who chew with and without tobacco. Some participants suggested that the nut itself is not harmful; rather, it is the addition of tobacco and/or lime that causes cancer.

The current study also found that some chewers are encouraged by their social group to chew. In addition to passively developing perceptions on AN, some chewers display minimal interest in supporting the cessation efforts of others. Despite substantive efforts to promote the existence of a cessation program, the acceptability of AN consumption, driven by the attitudes derived from the chewers' communal upbringing, may constrain the efforts to promote counselling-based programs (Osborne et al., 2017). Because of the role of AN in a community, whether social or cultural, the capacity to disseminate health risk information about AN is limited. Some chewers in the current study report that they would not refer others to participate in the program for fear of being viewed as a hypocrite. This is supported by Little et al. (2014a) who suggests that given the relevance of AN in Guam, some chewers might fear the social consequences associated with quitting. This creates an environment not conducive to an individual who may want to quit. Historically, there have been accounts of AN being considered a luxury food, restricted to elders and individuals with authority in a society (Williams et al., 2002), and though people in many social classes consume it today, AN is still associated with a sense of belonging and acceptance as previously demonstrated. Nonchewers also suggested that chewers are not fully supportive of others' efforts to quit. One nonchewer shared their knowledge of an individual who attempted to quit but had relapsed upon returning to their social group.

In addition to the social and cultural influence in quitting and joining a cessation program, there still exist common barriers such as the availability of the program. The process of administering a cessation program is as important as the content of the program because chewers will be less motivated to attend a program that does not accommodate their simplest needs: time and transportation. Transportation challenges were anticipated during the development of the betel quid cessation program (Moss, Kawamoto, Pokhrel, Paulino, & Herzog, 2015). However, it remains an issue with chewers in Guam according to most chewers and nonchewers in the study. Additionally, time constraints were introduced in the current study. Participants mentioned that chewers who work throughout the day find it difficult to commit time to attend a cessation program. This study uniquely adds from the perception of nonchewers that the rapport between the staff and the chewer is likely to influence the chewers' motivation to participate. For example, nonchewers agreed that a chewer may feel a sense of trust or comfort if they knew the facilitator of the cessation program.

Results of the current study indicate an overwhelming need to expand awareness on the harmful effects of AN chewing and on the benefits of joining a cessation program. It is not

surprising that the social and cultural acceptability of AN chewing deters chewers from quitting or joining a cessation program. Similar to e-cigarettes and hookah, where usage is perceived as less harmful and more acceptable than cigarette smoking, the degree of a normality for either behavior will increase the likelihood of individuals engaging in those behaviors (Akl et al., 2014; & FitzPatrick et al., 2019). Efforts to educate the community may include collaboration with public officials to launch a public health campaign or conducting presentations within the community. Measures should also be taken to incorporate AN lesson plans into school curriculum of adolescents, as targeting the youth has the potential to influence the perception of these acceptable, but harmful behaviors.

Further considerations should include the portability of a cessation curriculum. One recommendation from a study participant was to incorporate the program into a chewers' work schedule. This is a foreseeable effort as one nonchewer expressed interest in such collaboration. By consolidating the curriculum and mobilizing it, the cessation program could effectively address the chewers' most critical needs that prevent them from joining a cessation program: time and transportation. In addition, considering the variability of the relationship between the cessation staff and the chewer prior to participation, conducting the program sessions in the workplace, or any familiar environment, may enhance the chewers' level of comfort.

In summary, this study identified similar perceptions as previous studies regarding AN cessation (Ghani et al., 2011; Little et al., 2014a; Little et al., 2014b; Murphy et al., 2017; & Paulino et al. 2011). However, this study is unique in that it structures those perceptions as reasons for not wanting to quit or join a cessation program. Thus, the current study could have profound influence in advancing cessation efforts to other communities where AN chewing practice is socially and culturally relevant.

Strengths and Limitations

The results of the current study must be interpreted with consideration of the limitations faced. First, all chewers were Yapese and all nonchewers were female and, thus, are not representative of chewers and nonchewers in Guam. Although a larger number of participants would have produced variable responses respective of different ethnic perspectives, Yapese chewers had relevance to the BENIT study as they tend to be Class 2 chewers (Paulino et al., 2011). Second, the semi-structured questions did not directly address how to encourage AN chewers to quit. Such questions would further isolate appropriate methods for approaching a community where AN is important.

Despite the convenience sampling method yielding sampling limitations, the current study did exhibit notable strengths. The categorical results were similar throughout the interviews, suggesting that all areas were sufficiently addressed regarding the perception of AN. Participants provided recommendations on how to increase awareness on the effects of AN consumption, such as posting flyers in stores that sell AN, or creating advertisements similar to anti-tobacco campaigns. Likewise, some chewers noted that they would like to see more information on AN and the cessation program, suggesting that chewers may be ready to entertain the idea of AN cessation.

Conclusion

Challenges will occur when advocating against a substance that is socially and culturally acceptable in a community. Clearly, increasing awareness of the effects of AN as well as the existence of the cessation program is needed to overcome recruitment obstacles in future AN cessation studies. Increasing the availability of information regarding AN will help to mold the perception of AN for those who are currently not ready to quit. For those who are ready to quit, packaging the cessation curriculum into a portable program will help to alleviate some immediate barriers of joining a cessation program, including time and transportation. Future research should develop a curriculum for educating the community on the uses of AN.

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Table 1.

Semi-structured questions asked to chewers (Ch) and adjusted to nonchewers (NCh)

1. Ch[1]: What is it about betel nut chewing that makes you want to continue to chew? NCh[1]: What is it about betel nut chewing that you think makes betel nut chewers continue to chew?
2. Ch[2]: What is it about betel nut chewing that might make you want to quit? NCh[2] What is it about chewing that you think might make want betel nut chewers want to quit?
3. Ch[3]: If a betel nut cessation program was available free of charge, would you be willing to participate in the program? Why/why not? NCh[3]: If a betel nut cessation program was available free of charge, do you think chewers would be willing to participate in the program? Why/why not?
4. Would you encourage other betel nut chewers to participate in the program? Why/why not?[4, 5]
5. Is there anything else about betel nut use that you would like to share?[5]

[1]Some probes included inquiry on taste of betel nut, habit of preparing betel nut, or habit of chewing.

[2]Some probes included inquiry on health consequences, expenses, or appearance (e.g. staining of oral cavity).

[3]Some probes included inquiry on potential barriers such as readiness, commitment, or shame. Follow-up probes may include suggestions on ways to remove barriers

[4]Some probes included inquiry on potential motivators such as helping family and friends. Follow-up probes may include suggestions on ways to encourage and motivate chewers.

[5]Asked to both Ch and NCh.

Table 2.

Reasons not to quit as perceived by chewers and nonchewers

	Chewer	Nonchewer
Sociocultural		
Enabling Community	My boss actually gives me money […] Yeah from his wallet, how much you need, because he wants the job to be done. If you gather around with your friends or family, they instantly take out their betel nut and fix their chew. So you just sit there, 'oh okay, I already quit.' But then you're like, 'ah you know what, I just want to join in. Just this time,' but then it goes on and on.	I know one person who quit betel nut, and then he went back to live with his family. His whole family chews so he began to chew again […] There's no support to say 'don't chew.' I guess like they grew up back there where everyone's chewing, and like everyone is the same as everyone. Like it's hard not to follow them.
Cultural Ideology	You've heard that phrase, 'wisdom in the basket,' […] That's very true. That's the time where you go into your basket to get out a betel nut, and you're taking time to think about what you're going to respond. Actually, if you chew and it stained your teeth, that's what makes your teeth stronger.	Some of the patients that I've interviewed, they said that it's been introduced to them as you as, you know, it's part of their culture. I think living in the islands, it's just a very enabling environment because you always have that scapegoat to blame it on culture.
Belief that Betel nut is Harmless	Personally, if I wanted to quit […] it's the quitting of the tobacco that's the issue […] So for me, it's not really about the betel nut. The cigarette is the addicting part I hear it in a lot of the older people, and they say, 'Well look at so and so. They're 80 years old and they have all of their teeth, and they attribute that to […] when they say they were a chewer all their life.'	I think they don't really see it happening. Like say a family unit, the grandfather may chew and then he passes [tradition] onto his grandkids. The grandkid say that they don't see anything happening with the grandfather. So they think that it's not a health issue. Based on my family, it's like I feel they wouldn't want to quit. Like they do know you get cancer and everything, but it's like it doesn't change their [mind]. It's like they don't care and when it comes to cancer, it's like they think it won't happen to them.
Behavioral		
Addictive	To me, it's just like something better, you're like addicted to. It's kind of hard to stop My boss asked me, 'How come you're always carrying your bag with you?' And I said, 'Yeah because [it's] my life.' If you put the right combination, you know? The right amount of lime and cigarette. It's just perfect. [It] turns out perfect.	They said they are trying very hard to stop, so that tells me that it's, you know, an addiction, and they are having a difficult time with it. To them it is addictive. And even though people would tell them to stop chewing or their parents would tell them to stop, they keep on because they like the taste.
Euphoric	It gives me a high, that only betel nut can provide.	My family likes that aspect [taste] of it, and also gives them like a high effect.
Attentiveness	I work at night, so I got to have my betel nut. [It] keeps you awake. You stay up. It keeps you awake. Not like an energy drink. But it does keep you [awake] I think that's also […] I used to always pick these guys at work in the middle of the night, and so I fix betel nut because it keeps me awake on the road.	Like what they tell me is that when they chew, it keeps them awake or something
Relaxing	I think it's more of a chance to sit down. But there [work] I will be doing things then I stop and fix my chew. Maybe I use that as, like I take a break. If I don't have betel nut, I'm pissed off. I'd rather be like, nobody's going to talk to me.	It relaxes them. So it sort of like, makes them calm.
Habitual	It's like, after a meal, breakfast, you want to chew betel nut.	I think it's, it's a habit for them.
Accessibility		
Convenience of Betel nut	To me it's much better. I have to sit where I'm at and chew, instead of smoke – I have to find a spot, go outside. I saw [someone] actually using Quest cards to purchase betel nut at one of the stores here […] and I didn't know if that was a violation, or if that's just not regulated to where it's acceptable for that – the Quest card.	They can hide it a little better, or they think they can […] So I think betel nut is a little sneakier. They would say it's available in any mom and pop store. That like a plastic bag of it is like only two (2) dollars or something. So it's really cheaper than cigarettes. […] And some of them they can get from their neighbors.

	Chewer	Nonchewer
Lack Information on Betel nut	You see a lot of advertisements in anti-smoking, but I don't see advertisements on anti-chewing I don't know that there is very much that I've seen [about betel nut] because I work with schools, and I don't see very much in their curriculum that deals with this.	I've never learned about it. Like they tell you stay away from alcohol and those stuff, but not really betel nut I think it's because they don't find anything wrong with it, unless you point out the immediate risk of cardiovascular diseases, or like dental problems, or like the latest studies saying it has some carcinogen. But I don't think it strikes them as something as important, they have to change their behavior.

Table 3.

Reasons not to join a cessation program as perceived by chewers and nonchewers

	Chewer	Nonchewer
Sociocultural		
Lack Relatability and Advocacy	[…] but on the other side, I don't want to tell them about the program because I'm not quitting, and I'm going to be telling them 'you should go quit. You should go join.' If I'm not going, which I don't think I am, then that'll be like a hypocrite. Like what kind of example are you setting? If you're not going to go, then why are you telling me to go?	I think that it helps, too, if they know the people […] That they know who's in charge of the program. Or like, say it's their friends and family, 'Oh I know them, I can trust them. I think maybe if, like chewers were able to meet someone who chewed before and they quit. And maybe they had some health issues just so that care from someone who actually experienced what they experienced. Because it's hard to like, someone who doesn't chew, like telling you to stop, because they don't understand what it's like.
Belief in Self-Help	I think anybody can decide to stop chewing betel nut. I can still stop anytime I want, because when I was in the military, we don't chew betel nut. So I stopped and nothing. You know us Micronesians, you know, say 'I can always quit tomorrow.'	n/a
Accessibility		
Inconvenience of Program	I know a lot of […] young adults. They're all working and it's really difficult for them to make a time commitment. Transportation is the problem because most chewers here are Micronesian, and not all the Micronesian's have transportation […] They have to wait until the afternoon, until the family or whoever has [the] care to get off work It's like for me, I don't need it [program]. I don't need help. I can quit.	Another thing is like, maybe to avoid, or get rid of the barrier for it being inconvenient to go to the meeting. Maybe bring as close as possible to them.

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