Cytisine as an alternative smoking cessation product for Pacific smokers in New Zealand.

Vili NOSA,1 Kotalo LEAU,2 Natalie WALKER3

ABSTRACT

Introduction: Pacific people in New Zealand have one of the highest rates of smoking. Cytisine is a plant-based alkaloid that has proven efficacy, effectiveness and safety compared to a placebo and nicotine replacement therapy (NRT) for smoking cessation. Cytisine, like varenicline, is a partial agonist of nicotinic acetylcholine receptors, and blocks the rewarding effects of nicotine. Cytisine is naturally found in some plants in the Pacific region, and so may appeal to Pacific smokers wanting to quit. This paper investigates the acceptability of cytisine as a smoking cessation product for Pacific smokers in New Zealand, using a qualitative study design.

Methods: In December 2015, advertisements and snowball sampling was used to recruit four Pacific smokers and three Pacific smoking cessation specialists in Auckland, New Zealand. Semi-structured interviews were undertaken, whereby participants were asked about motivations to quit and their views on smoking cessation products, including cytisine (which is currently unavailable in New Zealand). Interviews were recorded and transcribed verbatim, with thematic analysis conducted manually.

Findings: Pacific smokers reported wanting to quit for loved ones and family, but did not find currently available smoking cessation products effective. Almost all participants had not previously heard of cytisine, but many of the Pacific smokers were keen to try it. Participants identified with cytisine on a cultural basis (given its natural status), but noted that their use would be determined by the efficacy of the medicine, its cost, side-effects, and accessibility. They were particularly interested in cytisine being made available in liquid form, which could be added to a “smoothie” or drunk as a “traditional tea”. Participants thought cytisine should be promoted in a culturally-appropriate way, with packaging and advertising designed to appeal to Pacific smokers.

Conclusions: Cytisine is more acceptable to Pacific smokers than other smoking cessation products, because of their cultural practices of traditional medicine and the natural product status of cytisine.

KEYWORDS: Smoking Cessation; Health Promotion; Cytisine; Pacific health

INTRODUCTION

Tobacco smoking is the single largest cause of preventable morbidity and mortality in New Zealand, killing an estimated 4,300 people annually. Pacific peoples in New Zealand carry a disproportionate burden of smoking-related harm, due to their higher prevalence of daily smoking compared to the general population (21.8% in adults aged ≥15 years in 2016/17 compared to 13.8%).1 Pacific men smoke more than Pacific women (25.4% vs 18.4%).1

Pacific peoples encompass a diverse range of ethnicities, with the largest ethnic groups represented in New Zealand being Samoans, Cook

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Islanders, Tongans, Niueans, Tokelauans, and Fijians. Differences in smoking prevalence exist both within and between Pacific cultures. Cook Island and Tokelauan adults (aged ≥ 15 years) have much higher smoking prevalence’s (32% and 30% respectively), compared to Niuean (26%), Tongan (23%), Samoan (22%) and Fijian (13%) adults.² Cook Island and Tokelauan women and men smoke at similar rates, but women smoke at much lower rates than men for the other Pacific ethnicities.²

In 2012/13, Pacific smokers reported low levels of engagement with smoking cessation services (e.g. only 11% had sought help or advice from Quitline for their last quit attempt), and low uptake of currently available smoking cessation medications (e.g. only 23.4% had used NRT for their last quit attempt, and 4.9% had used another medication such as varenicline [Champix] or bupropion [Zyban]).³ A proposed alternative to these treatment options is cytisine, which is a plant-based alkaloid that has similar properties to nicotine, but acts as a partial agonist to the nicotine receptors.⁴ Cytisine interferes with nicotine binding and blocks the rewarding effects of the nicotine.⁴ Cytisine has been used in Central and Eastern Europe since the 1960s.⁵ Trials have shown cytisine to be more effective than both placebo⁶ and NRT⁷ at helping people to quit smoking, and is significantly cheaper than other smoking cessation medications.⁶

Cytisine is found naturally in some plants in the Pacific region, such as the Māmane (Sophora cyrsophylla) in Hawaii⁸ and the New Zealand Kowhai (Sophora tetrapetala).⁸⁻⁹ Pacific cultures as a whole place a high value on traditional healing as an alternative or dual system of care to Western medicine.¹⁰ This type of healing tends to prioritise the use of the natural world, such as herbs and plants for use in drinks, oils, and massage. Even within New Zealand, traditional healing is a well-utilised and supported practise among Pacific peoples.¹¹

The aim of this study was to investigate the acceptability of cytisine as an alternative smoking cessation product for Pacific smokers in New Zealand, using a qualitative study design. We hypothesised that cytisine would be more acceptable to Pacific smokers compared to other smoking cessation products because of their cultural practices of traditional medicine and the natural product status of cytisine.

METHODS

In December 2015, advertisements and a snowballing sampling process were used to recruit four Pacific smokers and three Pacific smoking cessation specialists in Auckland, New Zealand.

Participants

Current smokers were recruited through community organisations (such as Pacific sports and churches, and community groups), and were eligible to take part if they were: a current smoker, aged ≥ 18 years, of Pacific ethnicity, able to speak English, and were motivated to quit smoking. Smoking cessation specialists were recruited through healthcare and community organisations, and were eligible to take part if they were: aged ≥ 18 years, of Pacific ethnicity, and worked as a smoking cessation specialist or Pacific traditional medicine specialist.

Procedures

All participants were interviewed at a location of their choice, with the interview conducted by a Samoan woman. The interviews were semi-structured and focused on: the use of smoking cessation products by Pacific people; motivations and barriers to smoking cessation for Pacific people; and the potential cultural impact of cytisine. Participants were given a brief description of cytisine, including the fact that cytisine is found naturally in some Pacific plants, and the marketed product was shown (packaged as Tabex® [brown pills] and Desmozan® [white and blue gel capsules] for smoking cessation). Interviews were audio-taped and transcribed verbatim. Thematic analysis was conducted manually using the general inductive method.

Ethics

Ethical approval was granted by University of Auckland Human Participants Ethics Committee (04/12/2015 Ref: 016177).

FINDINGS

Four Pacific smokers and three Pacific smoking cessation specialists were recruited (Table 1). The majority of participants identified as Samoan, and no traditional healers were identified.
Table 1: Characteristics of Participants

<table>
<thead>
<tr>
<th>Pacific smokers (N=3)</th>
<th>Pacific smoking cessation specialists (N=4)</th>
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<tbody>
<tr>
<td>Sex</td>
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Thematic Analysis

**Motivation to quit**

Participants saw smoking as a major issue for the Pacific population in New Zealand. They identified a number of barriers to quitting, including the use of smoking as a form of stress relief and to enhance other activities (such as the taste of alcohol). Many of the participants also discussed fears of nicotine withdrawal or gaining weight, as well as cravings and difficulties in changing habits.

“I thought yeah I can smoke and then as soon as all this is, you know the festive season is done, yeah then I can do it again” (Pacific Smoker 2)

Participants in the Pacific smokers group said their motivation to quit was to promote a better sense of wellbeing, and to live longer for the sake of loved ones

“I gotta look out for me, for the sake of my family” (Pacific Smoker 2)

Many said that smoking was currently preventing them from achieving certain goals and led to negative symptoms (such as nausea and asthma symptoms). Participants said motivation also came from family members; either through their encouragement or seeing a family member battling a smoking-related illness. One participant noted that their work environment was not conducive to smoking where “you almost feel like an outsider going out for a smoke”.

**Smoking cessation products**

Participants in the Pacific smoker group reported that the smoking cessation products currently available in New Zealand had been largely ineffective for them, and raised concerns with respect to the side-effects of NRT, which include nausea, sweatiness, and nicotine withdrawal. Some participants reported that the product had no effect. Taste was also a concern for the Pacific smokers, with lozenges and gums being described as “yucky” by many participants. Participants were also put off by the usage instructions (‘chew and park’), and felt these were too different from the normal method of using regular chewing gum.

“There’s just something about these products that can switch me off trying to use them regularly” (Pacific Smoker 1)

Alternative smoking cessation methods, such as liquid detoxes and herbal tree cigarettes, appealed to some participants as a way of improving overall health, but they did not feel these were effective long-term. One participant had tried a self-help book, but found this ineffective. Other participants reported finding prayer and will power to be the most important and effective methods for quitting smoking.

**Acceptability of cytisine**

Most participants had not heard of cytisine prior to taking part in the study. One participant in the Pacific smoking cessation specialists group had heard of cytisine previously at a conference. After a brief description, all participants said that cytisine sounded attractive from both a cultural and practical perspective.

“I would probably look more into it, you know it sounds appealing particularly when you’re talking that its natural extracts from, you know, resources that we have” (Pacific Smoker 1)

The main themes that promoted acceptability of cytisine were around the “home-grown” and “natural” status of cytisine. Most of the participants commented that the connection to cytisine would be enhanced by knowing which plants in the islands contained cytisine because “that’s our plant, it’s at home”.

“I think it will be good, the fact that it’s natural, the fact that it has a better connection” (Pacific Smoker 1)
Participants said that having a “cultural meaning” to the plants containing cytisine, such as the Māmane in Hawaii, would add to the appeal and use of the product. Participants also thought that giving cytisine this “local” status would endear the product to Pacific Island culture where “we just like things naturally... we like our natural environments”, because it is what is familiar when thinking of life back home in the islands. One participant said this would “make people more confident” as it “brings us back closer to the earth”.

Overwhelmingly, participants said that they would find cytisine more appealing if it was delivered in a different form. Specifically, they suggested that it would increase the appeal of cytisine in liquid forms similar to traditional medicine “in liquid form or can make it a liquid form” similar to “vais [liquids] that we have for fofos [traditional healing].” In terms of type of liquids, participants had an array of suggestions, with the younger participants (those under 30 years old) preferring to drink cytisine as part of a smoothie “getting it like a normal vegetable and blending it in ... as a juice” or a powder, “mixed in with some fruits”. They thought that this would appeal to Pacific peoples as a way to not only stop smoking, but increasing overall health, gaining “other beneficial nutrients”. One participant also thought that this method would fit well with popular Pacific health programmes that sell herbal supplements and products in New Zealand. Older participants (≥ 45 years old) preferred cytisine to be presented in more traditional liquid form, to match more traditional ways of using and drinking plant extracts, such as drying it and making “a lau ti [teabag] out of it”. This group also noted that there may be generational or cultural differences around views on cytisine, with preference dependent on taste and access to traditional healers. One older male participant also suggested to “get the seed, mix it, crush it and put it in kava” as a way to appeal to older male smokers because “kava and smoking are good friends”. Participants expressed preference for obtaining cytisine directly from its natural source over manufactured forms.

“It’s a natural extract - give it to me in its most natural form” (Pacific Smoker 4)

Most of the older participants also thought having cytisine as lozenges, patches, or mints, could help broaden its appeal. Participants thought these forms might be more appealing than tablets, with fewer side-effects and more adaptability to a working lifestyle. Some participants expressed concern that manufactured forms may dilute the cultural appeal of cytisine, or reduce the ability for people to make the connection between the manufactured product and its natural source.

Comparison of cytisine to other products

Most of the participants suggested that a “user-friendly” approach would be appealing for cytisine. In comparing cytisine to other products, two important themes emerged: the efficacy of cytisine, and cytisine as “a more natural approach”. Most the participants said that cytisine would appeal to them if it had worked for them or someone they knew.

“Ultimately if the product works, that would be like the biggest incentive for someone to try it” (Pacific Smoker 1)

Many of the Pacific smoker participants had tried other types of smoking cessation products with limited success and were more open to cytisine as “an alternative to what we already have”. Some participants were also more drawn to cytisine than the current products as it was not nicotine based. Cytisine was seen as “a more natural approach” with a view that it contained less harmful artificial chemicals.

“I guess being plant based, possibly a more natural approach to giving up cigarettes as opposed to a more chemical type product” (Pacific Smoker 2)

Many participants were wary of current smoking cessation products and what chemicals were in them “because you never know what they put in there”. One participant thought that synthetic products could increase dependence on them so “the effects of that actual product no longer works on you” without a change in dosage.

Barriers to using cytisine

When comparing cytisine to other products, participants noted issues that may arise with cytisine, such as cost, side-effects, false advertising, and possible usage issues. Many of the Pacific smokers pointed out that Pacific families are usually large, and have many expenses such as family, village, and church commitments, in addition to bills and other everyday costs. Therefore, cost may be a major factor when choosing a smoking cessation product. Participants suggested that uptake of cytisine might be limited if cytisine could only be accessed via prescription, compared to NRT’s which are available through Quitline and other...
smoking cessation services. One smoking cessation specialist felt cytisine should be subsidised or free.

“Especially PI [Pacific Island] people. It’s all about money… I wouldn’t buy it, unless I know for sure that it’s worked on someone I know” (Pacific Smoker 2)

Some participants talked about side-effects as a potential barrier to using cytisine.

“Side effects too… If people have a negative experience of the medication… they’ll be less likely to use it” (Pacific Smoking Cessation Specialist 2)

However, the Pacific smoker group thought that side-effects would come with any product, so it would not strongly reduce the appeal of cytisine in comparison to other products. Furthermore, the smoking cessation specialists usually emphasised the importance of understanding the potential for side-effects, because then “you can actually explain it” and patients can then make their own informed decisions about using cytisine.

One participant questioned whether cytisine found in plants in the islands would actually be used for a cytisine product in New Zealand. The participant was concerned that using European cytisine plants could reduce the trust of Pacific smokers in the product. The emphasis on native plant sources while using European sources could be construed as false-advertising.

“They might say it’s misleading. They’ll say cytisine yeah it’s in the kowhai plant but it’s not the kowhai plant that’s used for the cytisine we’re taking” (Pacific Smoking Cessation Specialist 2)

Many of the smoking cessation specialists noted that current products have complicated dosing regimen. With respect to cytisine, one smoking cessation specialist thought that clear, easily understandable instructions would be needed for proper use, especially when promoting its plant status in the islands.

**Cytisine in tablet form**

When shown two brands of tablets containing cytisine, participant views were mixed. In general, participants thought having a tablet form of cytisine could be effective because “at least you know everything goes in”. However, some participants thought that having a tablet had negative associations, such as illness and medical connotations. One participant noted that pills give the perception that they are sick rather than of promoting health.

“Thing is with medication is that people become sceptical just thinking, oh yup - they’re going to come up with something new, then it doesn’t work” (Pacific Smoking Cessation Specialist 2)

**Promotion of Cytisine to Pacific peoples**

All the participants thought that cytisine could be promoted in ways that appeal more to Pacific smokers, particularly through packaging and promoting it in culturally competent ways. For example, by using warm colours, rather than “clinical colours”, and by using green for the tablets to emphasise that cytisine is plant-based. Participants also suggested using pictures and coloured labels to help smokers take the tablets at the right time. Some participants noted that different Pacific islands have their own culture, and therefore promotional material might be tailored to the particular culture and the local plants in order to improve acceptability.

“For any cytisine products. Yeah give it the ownership if it’s plant based from the tropical plants from the Pacific” (Pacific Smoking Cessation Specialist 1)

Younger participants thought that using people of the same ethnicity who used cytisine to successfully quit smoking would be a powerful tool to promote uptake of cytisine. Participants noted the importance of treating elders with regard and to use respectful language, emphasising the importance of “knowing your boundaries” when communicating across ages and cultures. A smoking cessation worker emphasised translation as key to helping not only Pacific smokers in New Zealand, but in those in the islands too. Involving family and promoting at churches was also highlighted by the participants as ways to help maintain cytisine’s appeal by ensuring that the support networks for the smokers are strong.

“With our people... its just informing them... we’re face to face people. Talk us through it” (Pacific Smoker 4)

**DISCUSSION**

Participants in this study were motivated to quit for their health and loved ones, but reported that current cessation products were largely ineffective aids to quitting. Although cytisine was unheard of for most participants, many were keen...
to try it. As we hypothesised, participants identified with cytisine on a cultural basis, through the “home-grown” connection. Participants were also attracted to the “natural” branding of cytisine, seeing it as a more natural alternative to current products. Participants tended to favour the idea of having cytisine in a form that could be added to a smoothie or made into a tea (similar to traditional healing methods). However, some participants were unsure whether Pacific smokers would actually connect with cytisine just because of its link with the Pacific.

Participants suggested that their incentive for using cytisine would be determined by its efficacy, but also saw the natural-status as a positive incentive. Participants also thought that the appeal of cytisine could be enhanced by presenting the produce in culturally acceptable ways and using promotional material that appealed to Pacific peoples. However, participants raised concerns that cost and side-effects could be a barrier to wide spread use. Additionally, participants raised concern that the promotion of cytisine as a product found in Pacific plants could be misleading if used to advertise cytisine produced in Europe. Complexity of usage, such as the ‘chew and park’ method might also be a barrier to widespread use.

Due to limitations of time and the sampling methods used, it was not possible to recruit a more culturally diverse sample of participants. Therefore, the themes that emerged from this study may not be generalizable to other Pacific peoples (given each Pacific ethnicity has their own unique cultural customs and traditions). Furthermore, no traditional healers were identified for the study but are an important group to consider given their cultural knowledge and expertise around herbal medicine. A strength of the study is the diversity of participants, in terms of age, gender, and location (urban versus rural).

This study is the first to look at the acceptability of cytisine as an alternative smoking cessation product for Pacific Island smokers in New Zealand. The research follows on from a similar qualitative study in which the acceptability of cytisine to Māori smokers was explored and the same conclusions drawn. This study adds to the field of smoking cessation, showing the positive views of Pacific people towards plant based cessation products such as cytisine as a way of combatting the addictive effect of nicotine. Further research is needed to explore any contextual differences that might exist between different Pacific ethnicities, and between pacific peoples living in New Zealand and those living in the Pacific islands.

**CONCLUSION**

Overall, Pacific smokers and smoking cessation specialists find cytisine acceptable and attractive. Further research should be undertaken looking at different modes of delivery for cytisine, and how the medication might be promoted in culturally appropriate way for Pacific smokers. Our findings support the licencing of cytisine for use as a smoking cessation medication in New Zealand.

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**REFERENCES**


https://www.journalslibrary.nihr.ac.uk/hta/hta18330/#/abstract


https://www.researchgate.net/publication/270858629_The_Smoking_Cessation_Aid_Varenicline_Chantix_Champix_Drug_Discovery_Inspired_by_Natural_Products


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