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## Paan and Gutka Use in the United States: A Pilot Study in Bangladeshi and Indian-Gujarati Immigrants in New York City

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### Abstract

Smokeless tobacco and areca nut are popular with South Asians and South Asian immigrants, most commonly used as paan and gutka. Their regular use leads to oral cancer. The South Asian community in the U.S. is rapidly growing, where paan and gutka are readily available. The study was the first exploration of the migration of the paan and gutka habits, and their use in the U.S.

A 108-item questionnaire on paan and gutka usage and beliefs was administered to 138 first-generation Bangladeshi and Indian-Gujarati immigrant adults at community sites in the New York metropolitan area. Forty-five percent Indian-Gujaratis reported ever-regular paan use; of which 5% are current users. Thirty-one percent reported ever-regular gutka use; of which 77% are current users. Thirty-five percent Bangladeshis reported ever-regular paan use; of which 70% are current users. Nine percent reported ever-regular gutka use; of which 67% are current users. Bangladeshis are more likely to identify paan as causing oral cancer. Indian-Gujaratis are more likely to identify gutka as causing oral cancer.

Between the two communities, there were significant differences in paan and gutka usage, migration effects, and oral cancer risk perception. There is a need for comprehensive migration studies on the determinants of usage, and for community-specific interventions for these carcinogenic products.

### Keywords

Immigrants; smokeless tobacco; South Asians; oral cancer; paan; gutka

## INTRODUCTION

Over one million individuals migrate annually to the United States, presently home to over 33 million immigrants (U.S. Census, 2004). Immigrants in the United States represent diverse cultures, health beliefs, practices, and risk factors for disease. Despite an observed decrease in overall cancer death rates for the overall U.S. population, Immigrant minorities continue to experience disproportionately higher cancer incidence and mortality rates for many cancers (Marbella & Layde, 2001; Lin, Clarke, O'Malley, & Le, 2002). Smokeless tobacco control activities have largely missed the particular smokeless tobacco habits in diverse immigrant communities (Changrani & Gany, 2005). The use of smokeless tobacco, mixed with areca nut, is very popular in India and Bangladesh (International Agency for Research on Cancer, 2004). The culturally popular product is "paan," which consists of a number of ingredients, including tobacco, areca nut, slaked lime, and spices. Gutka is a commercially powdered mixture containing the same ingredients as paan. It was introduced in India nearly three decades ago. Paan and gutka are widely used in India and by Indian immigrants, and their use has spread across to other countries (Ramanathan, 1979; Seedat & van Wyk, 1984; Pearson, 1994; Summers, Williams, & Curzon, 1994; Bedi & Gilthorpe, 1995; Atwal, Warnakulasuriya, & Gelbier, 1996; Warnakulasuriya & Johnson, 1996; Shetty & Johnson, 1999; Vora, Yeoman, & Hayter, 2000; Asian Quitline, 2002; Warnakulasuriya, 2002; IARC, 2004).

Regular use of paan and gutka leads to oral cancer and precancerous conditions (Murti, Bhonsle, & Pindborg, 1985; Johnson, Ranasinghe, & Warnakulasuriya, 1993; Mehta & Maner, 1993; Murti, Bhonsle, & Gupta, 1995; Babu, Bhat, Kumar, Sesikaran, Rao, Aruna, & Reddy, 1996; Warnakulasuriya, Trivedy, Maher, & Johnson, 1997; Shah & Sharma, 1998; Gupta & Nandakumar, 1999; Trivedy, Craig, & Warnakulasuriya, 2002; IARC, 2004). Their use has resulted in India recording one of the highest global oral cancer rates (Indian Council of Medical Research, 1997; International Agency for Research on Cancer, 1997). These disparities are also experienced by Indian immigrants to Malaysia, South Africa, and the U.K. (Omar-Ahmed & Ramanathan, 1968; Van Wyk, Stander, Padayachee, & Grobler-Rabie, 1993; Swerdlow, Marmot, Grulich, Head, 1995), because of continued use of smokeless tobacco and areca nut after migration, Bangladeshi immigrants have also continued the practice of paan after migration. Several studies of Bangladeshi immigrants in the U.K, report that over 80% of adults, male and female, chewed paan regularly (Summers, Williams, Curzon, 1994; Bedi & Gilthorpe, 1995; Ahmed, Rahman, & Hull, 1997; Pearson, Croucher, Marcenes, & O'Farrell, 1999).

South Asian immigrants in the United States are among the fastest growing segment of the population, India was the second highest country of origin for legal immigrants admitted in 2001 (Immigration and Naturalization Service, 2002). In 2000, there were over 1.67 million 'Asian Indians' in the U.S., an increase of 106% from 1990 (U.S. Census, 2002). From 1990 to 2000, the Bangladeshi community in the United States increased by a staggering 350% (Le, 2004). New York City is a magnet for immigrants from India and Bangladesh. Indians represent the second-largest Asian group, comprising one-fourth of the City's Asian population (India Abroad Center for Political Awareness, 2003). As of 1996, Bangladesh was the sixth largest source of immigrants to New York City, up from 14th place in the early 1990s (New York City Department of City Planning, 1999).

Paan and gutka are legal and easily available in South Asian neighborhoods in New York City, at approximately two sachets for \$1 and at about one paan for \$1. The exact extent of paan and gutka use in the U.S. is unknown. However, the growing popularity of gutka use in die U.S. has troubled the public health community (Knight, 2002; Virasami, 2002). The extent to which paan and gutka use accompany Indian and Bangladeshi immigrants to the United States, and the resultant consequences, have not yet been studied (Changrani & Gany, 2005), The purpose

of the described pilot study was to explore the patterns of paan and gutka consumption in the Indian-Gujarati and Bangladeshi communities in the New York metropolitan area as a first step to address this gap in information. These types of studies have important implications for future smokeless tobacco investigations and interventions in these large, growing communities. Specifically, this pilot study provides previously unavailable smokeless tobacco use data, which is essential to allow for precise planning of larger, and definitive, paan and gutka oral cancer risk studies of paan and gutka use in U.S. South Asian immigrant populations.

## METHODS

This pilot study embodied principles of community-based research, and engaged the community in refinement of the questionnaire, participant recruitment, and data collection. A 108-item questionnaire was developed to collect information on: demographic, and socioeconomic indicators; access to health care; paan and gutka usage, including reasons for use; other tobacco and alcohol use; and beliefs about how paan and gutka affect health, including perceived risk for oral cancer. To develop the questionnaire, there was a consideration of several existing instruments, including: (i) National Oral Health Survey and Fluoride Mapping 2002 Questionnaire, Dental Council of India, New Delhi, India, (ii) Knowledge, Attitude, and Practices Oral Health Study Household Questionnaire, Bangalore, India, (iii) The Cancer Screening Questionnaire and the Research Subject Questionnaire of the RAAHP Center, and (iv) Fagerstorm Test for Nicotine Dependence (Heatherton, Kozlowski, Frecker, & Fagerstrom, 1991). In addition to reviewing existing questionnaires, we developed questions de novo for the study. The questionnaire was initially developed in English and then translated into Gujarati and Bengali, the primary languages of the two communities.

Participants were recruited by community-based convenience sampling in the New York metropolitan area from September 2003 to March 2004. Given the tremendous cultural diversity, and ethnic, linguistic, and regional complexity within India, the pilot was limited to one community. The Indian-Gujarati community was selected because of the large numbers in the U.S., and the New York Metropolitan Area. To reach the Gujarati community, the survey was administered at community sites, including grocery stores, community centers, and a community fair. Sites were recommended by community partners, and selected on the basis of high numbers of Indian-Gujaratis at the given sites, and community representation. Bangladeshi community members were recruited at two sites, including an occupational training center with a significant Bangladeshi population, and a Bangladeshi community fair.

Trained bilingual-bicultural research assistants screened community members and administered the questionnaire. All comers were approached and potential participants were screened for eligibility (age > 18 years; born in Gujarat, India or Bangladesh; and fluency in English or Gujarati or Bengali).

The independent variables used for the multivariate analysis of ever regular paan and gutka usage were: age, gender, education, household size, income, years in U.S., health insurance, and dental insurance. Patterns of paan and gutka use were described according to: age at initiation of use; tobacco and/or areca nut in paan/gutka; and quantity of use per day. Statistical tests included descriptive tests, tests for means and proportions (two sample t-tests), and regression analysis (binary logistic regression) where appropriate. Fisher's Exact Test (Fischer, 1925) was used instead of Chi-square test when testing small samples. Fisher's Exact Test calculates an exact probability value for the relationship between two dichotomous variables, as found in a two by two crosstable. It is preferred over the Chi-square test if there is a small value (Less than five) in one of the cells (Siegel, 1956). Microsoft Excel was used to store die data obtained. MINITAB<sup>®</sup> Statistical Software of Minitab, Inc., was used to analyze the data.

## RESULTS

One hundred-thirty participants were recruited, including 96 Bangladeshis (58% male), and 42 Indian-Gujaratis (54% male) (Table 1). Over 96% of eligible persons invited to participate agreed to be interviewed.

Regular paan use was defined as a minimum of 'at least weekly use of paan.' Regular gutka use was defined as 'at least a minimum weekly use of gutka.' Current regular use included those who chewed regularly in the past 12 months. Regular use prior to 12 months was considered as past regular use.

Overall reported ever regular use of paan was similar for the two groups (Table 2). Paan and gutka users and non-users were comparable in their age, years in the U.S., income, and access to health care. Bangladeshis who had not completed high school were more likely chew paan and gutka compared high school graduates (paan  $p = 0.012$ , gutka Fisher's exact test:  $p = 0.037$ ). Paan use difference was significant across genders in Indian-Gujaratis ( $p = 0.016$ ). Indian-Gujarati gutka users had larger family sizes compared with non-users (5.62 versus 3.86 persons/household,  $p = 0.006$ ). Past and current paan users were similar in terms of their age, years in the U.S, education, and income. Those who added tobacco to their paan consumed more quids per day (Bangladeshi  $p = 0.001$ , Indian-Gujarati  $p = 0.036$ ).

Past paan users provided reasons for quitting paan through an open-ended question. The Bangladeshis did not offer many responses, nor indicate any pattern. Clear reasons for quitting were offered by Indian-Gujaratis, including moving to the U.S., social unacceptability and unavailability in the U.S., and health reasons.

The Bangladeshis were somewhat more likely to identify paan as a cause of oral cancer than Indian-Gujaratis (about 66% vs 48%). Nearly all Indian-Gujaratis identified gutka as a cause of oral cancer (93%) and were more likely (93% vs 60%) to believe this than Bangladeshis. Bangladeshi high school graduates were more likely to state that paan and gutka cause oral cancer, compared with Bangladeshis who had not completed high school (Fisher's exact test: Paan  $p = 0.077$ , Gutka  $p = 0.029$ )

The beneficial health effects of paan were cited as "relieves constipation," "improves stamina," "fights cold," relieving tension, and for mood improvement. The harmful health effects of paan were cited as causing cancer, dental problems, ulcers, addiction, and hypertension. The beneficial health effects of gutka were cited as "tension reliever," "helps bowel movements," "mood improvement," and "increasing stamina." The harmful health effects of gutka were cited as: causing dental problems, "chest pain or burning," hypertension, "tissue in mouth becomes white," "cannot open the mouth," and addiction.

## DISCUSSION

To the best of our knowledge, this pilot study was the first examination of paan and gutka use in the United States. The study was an exploratory investigation using a convenience sampling methodology. The limitations of such a method are that the results are not generalizable to the Bangladeshi and Indian-Gujarati communities at large, and there is no information on the potential representativeness of the sample. However, the community-based nature of the research suggests that the data likely have a degree of validity, and given that degree of validity, increases the utility of these data for the planning of future studies. As these data provide previously unavailable paan and gutka use and belief data, they will be essential to allow for precise planning of larger, definitive, oral cancer risk studies on paan and gutka use in the U.S.

Several important themes and disconcerting preliminary results have emerged from the pilot study. The communities had migrated with paan and gutka, putting themselves at significant risk for oral cancer. However, even within the two communities, there were significant differences in the patterns of use of paan and gutka, the effect of migration upon the use of these products, and the community members' perceptions of the oral cancer risk posed by these products.

Over 54% of gutka use in Indian-Gujaratis was initiated in the U.S., perhaps because of the socially unacceptability of, and difficulty in obtaining, paan. Gutka's ease of procurement, storage, and lack of social stigma may promote the switch from paan. Paan was popular in Bangladeshis, and used currently by one out of four persons, yet gutka use was considerably limited. This may be attributable to gutka's origin in India, and subsequent, spread to other countries.

While migration is a key factor in overall gutka use in the Indian-Gujarati participants, an important difference is the complete absence of gutka use in the women in Indian-Gujarati community in the U.S. In India, there is considerable use of gutka in the women (Gupta & CS, 2003). While this may be in part because of the small sample size, it may also be related to the differential effect of migration.

Of interest were the Indian-Gujaratis' perceptions of paan and gutka's different potentials to cause oral cancer, with fewer than 50% stating that paan, and over 90% stating that gutka, could cause oral cancer.

Several Indian-Gujaratis were aware of additional oral health risks posed by gutka, including those of leukoplakia and submucous fibrosis, described by the participants as "tissue in mouth become white" and "cannot open the mouth." Fewer than 60% of Bangladeshis were aware of the oral cancer risk posed by gutka, perhaps because of the "newness" of gutka in Bangladesh.

In conclusion, the pilot study results highlight the need to tailor cancer research and interventions in the U.S. in a community-specific approach, even down to the level of sub-groups within the immigrant South Asian community. Cancer disparities in immigrants exist because of a number of complex, inter-related factors. A significant proportion of oral cancer risk factor assessment and intervention planning in this community would be missed if restricted to "traditional" risk factors. Cancer control in immigrants must take into account the cultural, epidemiologic, and immigration-related factors that lead to cancer disparities in these communities. In this example, efforts need to be made by researchers to partner with the community to conduct epidemiological, anthropological and migration studies on paan and gutka use in the U.S.

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TABLE 1

## Demographics of Pilot Study Participants

	<b>Bangladeshi (n = 96)</b>	<b>Indian Gujarati (n = 42)</b>
Gender (% Male)	58%	54%
Age	43.3 (SD = 12.8)	49.2 (SD = 18.7)
Years In U.S.	9.9 (SD = 7.7)	9.6 (SD = 7.2)
Completed High School	85%	85%
Currently Employed	60%*	69%
Mean Household Size	4.2 (SD = 1.9)	4.4 (SD = 1.9)
Mean Household Income in Past Year	\$26,788 (SD = \$26,520)	\$42,658 (SD = \$14,150)
Had Health Insurance	39%	50%
Had Dental Insurance	22%	29%

\* = Bangladeshi men were more likely to be employed ( $p < 0.001$ ) than the women



TABLE 2

## Paan and Gutka Use

	Paan Use		Gutka Use	
	Bangladeshi (n = 96)	Indian-Gujarati (n = 42)	Bangladeshi (n = 96)	Indian-Gujarati (n = 42)
Ever Used Paan/Gutka Regularly?	Yes = 35%	Yes = 45%	Yes = 9%	Yes = 31%
Current Status in Ever Used Regularly				
Past	30%	95%	33%	23%
Current	70%	5%	67%	77%
Use Across Gender				
Male	32%	61%	88%	100%
Female	40%	26%	22%	0%
Initiation of Use				
Initiated Before Age 18	47%	35%	11%	0%
Initiated Prior to Migration to U.S.	100%	100%	78%	46%
Tobacco and Areca Nut in Paan/Gutka *				
Tobacco and Areca Nut	44%	47%	56%	69%
Only Tobacco	0%	0%	0%	0%
Only Areca Nut	50%	53%	44%	31%
Neither **	6%	0%	N/A	N/A
Quantity of Use Per Day (# of paan quids/ sachets of gutka)				
Added Tobacco	6.2	8.9	2	6.5
No Tobacco	0.6	1.7	1.2	1.75

\* Gutka without tobacco is also known as "paan masala"

\*\* Paan may be consumed without tobacco and areca nut. As such, it does not pose any risk for oral cancer.