Title:
Under-reporting of tobacco use among Bangladeshi women in England

Authors:
Roth MA, Aitsi-Selmi A, Wardle H, Mindell J.

Author information:

Marilyn A Roth
Research Associate
Health and Social Surveys Research Group
Department of Epidemiology and Public Health
University College London
1-19 Torrington Place
London, UK WC1E 6BT

Dr Amina Aitsi-Selmi
Academic Clinical Fellow
Department of Epidemiology and Public Health
University College London
London, UK WC1E 6BT

Heather Wardle
Research Director
National Centre for Social Research, London, UK

Dr Jennifer Mindell
Clinical Senior Lecturer
Health and Social Surveys Group
Department of Epidemiology & Public Health
University College London
London, UK WC1E 6BT

Corresponding author:

Marilyn Roth
Email: m.roth@ucl.ac.uk
Telephone: +44 (0)20 7679 1733
Fax: +44 (0)20 7813 0242

Abstract

Background: This study investigates the prevalence of under-reported use of tobacco among Bangladeshi women and the characteristics of this group.

Methods: The 1999 and 2004 Health Survey for England included 996 Bangladeshi women aged 16 years and above, 302 with a valid saliva sample and 694 without. The main outcome measure was the prevalence of under-reported tobacco use.

Results: 15% of Bangladeshi women with a saliva sample under-reported their personal tobacco use. Under-reporters were very similar to self-reported users except for being much more likely to report chewing paan without tobacco (47% vs. 9%, $p<0.001$). Under-reporters differed significantly from cotinine-validated non-users in most respects. Regression analyses confirmed that under-reporters and self-reported users were similar in age, education level, and exposure to passive smoking. Under-reporters were older and less educated than cotinine-validated non-users. Both self-reported users (OR 0.11, 95% CI 0.04-0.30) and cotinine-validated non-users (OR 0.42, 95% CI 0.20-0.89) were far less likely to report chewing paan without tobacco compared with under-reporters.

Conclusions: Contrary to our *a priori* hypothesis, under-reporters were not young, British-born, English-speaking women likely to be concealing smoking but resembled self-reported tobacco users except for being much more likely to report chewing paan without tobacco.

Introduction

National estimates of tobacco use among minority ethnic groups have shown a consistent discrepancy between self-reported use of tobacco and cotinine-adjusted use of tobacco in the Bangladeshi population, [1,2] particularly among women (self-reported use 27% and cotinine-adjusted use 38% in 1999;[1] 17% and 35% respectively in 2004)[2].

Bangladeshi women are unique among minority ethnic groups in that almost all reported tobacco use is derived from tobacco chewing (16%) rather than cigarette smoking (2%).[2] There is a stigma associated with women who smoke in South Asian culture, but no such stigma exists in relation to using smokeless tobacco, so it is a commonly accepted practice. Practices associated with the use of smokeless tobacco vary by region and other socio-cultural customs. Tobacco is usually chewed with paan quid. The most common form of paan quid is a mixture of betel leaf, lime and areca nut, although the addition of spices (i.e. cardamom pods, saffron, cloves) often varies according to local custom. The paan mixture can also be chewed without tobacco. Chewing paan quid is generally believed to have medicinal value in that it can relieve headache and stomach ache, as well as freshen breath and strengthen gums. Aside from paan quid with tobacco, other forms of smokeless tobacco common to Bangladeshis include zarda and gutka, both commercialized forms of tobacco mixed with various other ingredients. [3] Targeting Bangladeshi women for health promotion is important given the link between smokeless tobacco use and health inequalities. Chewing the paan leaf itself is relatively harmless, but many users in rural areas of South Asia are unaware of the health risks associated with chewing paan mixed with the other common ingredients or with tobacco.[3] Chewing smokeless tobacco and paan quid is associated with health risks including oral cancer, oesophageal cancer, oral submucous fibrosis, asthma, hypertension, diabetes, and cardiovascular mortality. [3-7] Despite these associations, two systematic reviews examining the health effects associated with smokeless tobacco caution against inflating these health risks and call for more rigorous studies with larger samples sizes. The systematic reviews also highlight common limitations that befall most studies on smokeless tobacco, including a lack of statistical power due to small sample

sizes, the use of data not specifically designed to study smokeless tobacco use, poor control of cigarette smoking, and other methodological and study design limitations. [8-9]

Estimates of the prevalence of both practices - chewing paan with, and without, tobacco - among Bangladeshi women living in Britain vary,[10] 70-95% of Bangladeshi women being reported to chew paan and 50-82% reported to add tobacco.[11] In one study 48.5% of a sample of Bangladeshi women from Tower Hamlets in London reported chewing paan with tobacco, while in another study 43% of Bangladeshi women surveyed in an inner-city London practice reported chewing paan with tobacco (compared with 29% of men), suggesting it may be more common in women in some areas than reported nationally in HSE.[10,12] Possible explanations for this variation and the under-reporting of tobacco use include different study designs, question wording, population groups, and sampling methods. This may be particularly relevant in older women as a result of language barriers and other cultural factors, especially given that Bangladeshi women who chew paan are generally older and less educated than non-users.[13] Unlike previous studies, this study provides a unique opportunity to establish the prevalence of cotinine validated tobacco use.

This paper aims to establish the prevalence of under-reported use of tobacco - both smoked and smokeless - among Bangladeshi women and to investigate the characteristics of this group. We hypothesized that the discrepancy between prevalence of self-reported tobacco use and cotinine-adjusted tobacco use was probably due to younger, Westernised, Bangladeshi women growing up in the UK adopting smoking habits of their English peers, as has been suggested by Markham and colleagues, in a culturally conservative environment that stigmatises cigarette smoking by females.[14] Health professionals may assume that Bangladeshi women do not smoke and exclude them from relevant health promotion and smoking cessation support. Better characterisation of this population and defining risk factors associated with under-reporting could help in designing more focused preventive strategies in the context of overall tobacco use reduction.

Methods

The Health Survey for England is a nationally representative cross-sectional survey of a random sample of the general population living in private households in England, including people from minority ethnic groups. In 1999 and 2004, the national surveys focused on the health of ethnic minorities by boosting the core national sample for these two years.[15-16] The ethnic boost sample was designed to increase the sample sizes for analyses of the six (seven in 2004) largest minority ethnic groups in England including the Bangladeshi population. Sampling methods, data collection and results for tobacco use were not significantly different between the two survey years 1999 and 2004, allowing combination of the datasets from the two relevant years to increase participant numbers for the analyses in this paper.

All adult participants completed an interview with an experienced, fully trained interviewer. Interviewers were given strict instructions on how to administer the questionnaire to minimise information bias. Bilingual interviewers and translated survey materials were available. All participants were asked "Do you smoke cigarettes at all nowadays?" Indian, Pakistani, and Bangladeshi participants were also asked, "Which, if any, of these do you use nowadays? Paan with tobacco (zarda); paan without tobacco; paan masala; chewing tobacco; hukka; bidi; other tobacco substances (excluding cigarettes, cigars, pipes); none of these.

The second stage of the schedule was a visit by a trained nurse, during which further information and biological samples were collected and measurements made. Cotinine levels were measured in those who provided a saliva sample. Among co-operating households, response rates for the Bangladeshi group for interview, nurse visit and providing a saliva sample were 90%, 49% and 47% respectively in 1999 and 89%, 33% and 28% in 2004.

Saliva samples collected from consenting participants were posted to the Royal Victoria Infirmary, Newcastle, and then stored at $4^{o}C$ until sent weekly to the Nicotine Laboratory at New Cross Hospital for analysis using a Hewlett Packard hp5890 gas chromatograph,

with a rapid-liquid chromatography technique. This technique, and precautions around the laboratory, enables detection of very low levels of cotinine, reflecting exposure to others' tobacco smoke. A salivary cotinine of ≥ 15ng/ml is a conservative cut-off point indicating personal tobacco use.[17]

Data from 1999 and 2004 participants were compared using chi-square tests and t-tests. After establishing that there were no significant differences in prevalence of tobacco use by age-group between the two years, the datasets were combined.

Results for women who reported chewing or smoking tobacco were compared with those who did not report tobacco use. Data were analysed separately for women who did and did not provide a saliva sample for cotinine measurement. Those with a cotinine measurement were divided into women who did not use tobacco themselves (cotinine <15ng/ml) and those whose cotinine level reflected personal tobacco use (cotinine ≥ 15ng/ml) despite not reporting this, referred to in this paper as 'under-reporters'. In the case of the under-reporters, their self-reported tobacco use is at variance with their actual cotinine level.

We analysed data available for all Bangladeshi women aged 16 years and over including self-reported use of tobacco (smoked and chewed) by age, cotinine level, country of birth and religion, language variables, education, equivalized household income, whether they reported chewing paan without tobacco, passive smoking exposure at home, and variables indicative of who was present during the interview. Results are presented for the 302 Bangladeshi women who did and 694 Bangladeshi women who did not provide a saliva sample.

In addition to the descriptive analyses, multinomial logistic regression analyses were conducted to predict tobacco use status: self-reported user; cotinine-validated non-user; and under-reporting user. Under-reporters were used as the reference category for the outcome variable. The selection of control variables for inclusion in the model was informed by the results of the descriptive analyses. One discrepancy that warranted

further investigation through regression analyses was the much higher proportion of respondents in the under-reporting group who reported chewing paan without tobacco, as this had potential to shed light on their higher than expected cotinine levels.

It should also be noted that because of numerous factors, including sample size and issues with collinearity, the number of independent variables inserted in the regression model had to be limited. Due to the relatively homogenous nature of respondents in the self-reported and under-reported groups with respect to socio-demographic and cultural variables such as religion, country of birth, education, income, and language of the interview, some of these variables were potentially collinear. Therefore, we had to choose the most suitable variable rather than trying to include them all. Age, education, cultural variables, tobacco-related, and social tie/familial variables all emerged as possible predictors of tobacco use status. Education was highly correlated with cultural variables, including country of birth, level of spoken English, and language of interview. While education and specific cultural indicators may be distinct predictors of tobacco use, in the context of this study, the education variable was inextricably linked to each cultural variable. After performing correlation tests and stepwise regression, it became apparent that in addition to providing insight into how education is related to tobacco use status, the education variable could also be used as a quasi cultural indicator in the multinomial logistic regression model. The education variable was consistently chosen over the other cultural variables and the social tie/familial variables in the stepwise tests as the most informative predictor. The final regression analysis was conducted on 295 cases, after seven respondents were excluded because of missing values on whether they chew paan without tobacco. Data were analysed in SPSS 15.0 to generate chi square tests, t-tests, and the regression model.

Data for adults from the 1999 and 2004 minority ethnic boost samples were previously weighted to eliminate imbalances caused by the use of different probabilities of selection.[11-12] The data from 2004 also included non-response weights.[14] However, since the 1999 data did not include weights for non-response, only selection weighting has been applied to the combined data for this study's analyses.

In both years' reports, additional weights were applied to the cotinine data to weight for any discrepancy in non-response between the nurse and interviewer visit,[1-2] however the use of the cotinine weights was not needed for the analyses undertaken in this paper. The mean weights for Bangladeshi women who did provide a saliva sample were 0.48 and for those who did not provide a saliva sample were 0.46. This difference is negligible and lends support to the fact that there were no real differences in the characteristics of those who provided a saliva sample compared with those who did not.

As only 16 women reported smoking (one cigar, 15 cigarettes, of whom only two had a nurse visit and provided a saliva sample), analysis of self-reported smokers alone was not feasible in this study.

Results

Cotinine-adjusted tobacco use figures were consistent in the two years for which data are available, although self-reported users differed significantly with 29% of the 542 women interviewed in 1999 compared with 17% of the 469 women in 2004 reported using tobacco (χ^2= 19.66, p=0.000). Cotinine-adjusted tobacco use was 38% in the 177 women who provided a saliva sample in 1999 and 35% in the 182 women in 2004 (χ^2= 2.32, p=0.128). Twenty percent of those who reported no tobacco use had cotinine levels indicative of personal use of tobacco. Unexpectedly, 21% of women who reported that they use tobacco products had a cotinine level below 15ng/mL.

Table 1 compares the characteristics of Bangladeshi women who did and did not provide saliva samples, by self-reported tobacco use status and by cotinine level (for those who provided a saliva sample). The characteristics of women who did not provide a saliva sample (in most cases because they did not have a nurse visit rather than choosing not to provide a saliva sample) did not differ significantly from the characteristics of the women who did provide a saliva sample. This is the case for both women who reported chewing tobacco and also for women who reported no tobacco use and had no saliva

sample compared with women who reported no tobacco use and had a cotinine level below 15ng/ml.

Fifteen percent of Bangladeshi women with a saliva sample under-reported their personal tobacco use. Bangladeshi women who under-reported tobacco use had remarkably similar characteristics to those who reported chewing tobacco (Table 1). Common features among women who under-reported tobacco and women who reported chewing tobacco were their age (older); country of birth (almost all born abroad); education level (few with O levels/ GSCE or above); low levels of spoken English; likelihood of having the interview conducted wholly in another language; and likelihood of having their own or related children present at the interview.

In contrast with each of these two groups, women who reported no tobacco use and had a cotinine level <15ng/ml were younger, more likely to be born in England, more highly educated, more likely to speak English very well, and more likely to have had the interview conducted wholly in English.

In general, the under-reported tobacco users in this survey did not differ significantly from the self-reported users in their socio-demographic characteristics. However, the prevalence of reporting 'chewing paan without tobacco' was much higher in those who under-reported tobacco use (47% vs. 9%, $p<0.001$).

Table 2 displays the results of the multinomial logistic regression model with tobacco use status as the outcome variable and under-reporting tobaccos users as the reference category. Overall, the regression results supported the descriptive findings in Table 1. Regression analyses confirmed that under-reporters did not differ significantly from self-reported users in terms of age, education level, or exposure to passive smoking. Under-reporters were generally older and less likely to be educated above O level compared with cotinine-validated non-users. Both self-reported users (odds ratio 0.11, 95% CI 0.04-0.30) and cotinine-validated non-users (odds ratio 0.42, 95% CI 0.20-0.89) were far less likely to report chewing paan without tobacco compared with under-reporters.

Discussion

Main findings of this study

This study investigates the prevalence of under-reported tobacco use in Bangladeshi women and the characteristics of this group. Our analyses suggest that reporting chewing paan without tobacco accounts for nearly half of the Bangladeshi women in the sample with undisclosed personal tobacco use. The under-reporters differed substantially from continine-validated non-users but were remarkably similar to self-reported users apart from being much more likely to report chewing paan without tobacco. This suggests that some of them may actually be chewing paan with tobacco.

What is already known

Chewing paan with tobacco carries serious health risks, including cancer and cardiovascular mortality.[3,7] Chewing paan with or without tobacco is common among Bangladeshi women in the UK, although estimates of the prevalence of these practices vary.[10] National cotinine-adjusted figures reveal that the prevalence of tobacco use among Bangladeshi women is considerably higher than self-report figures indicate.[1-2]

What this study adds

One possible explanation for under-reporting includes concealment of smoking by younger, more acculturated women, which was our *a priori* hypothesis. Given the number of participants born in England who reported no tobacco use but did not provide a saliva sample, it is reasonable to speculate that at least some of these women may be smokers. Due to limitations with the data, we cannot prove or disprove that some of the under-reporting could also be attributed to these more acculturated women. However, the socio-demographic characteristics of the under-reporters were very similar to those who reported chewing tobacco but differed markedly from the cotinine-validated non-users of tobacco, whose socio-demographic profile matched the group our *a priori* hypothesis identified as likely undisclosed smokers.

The most likely explanation for the discrepancy between self-reported non-use of tobacco and saliva cotinine levels indicating personal tobacco use in participants in the Health Survey for England is chewing paan that actually contains tobacco. The regression analysis revealed that under-reporting tobacco users were more likely to report chewing paan without tobacco compared with both self-reported tobacco chewers and cotinine-validated non-users. Presumably the validated non-users do not chew paan at all, while the self-reported chewers report chewing paan with tobacco. It would seem, then, that at least some of the under-reporters are unknowingly chewing paan that contains tobacco. Qualitative analysis would contribute to testing this hypothesis and to discovering whether the responses indicated concealment or a lack of awareness that the paan they use contains tobacco. Heavy exposure to passive smoking would be another possible explanation, as values up to 20ng/ml can be caused by heavy exposure.[18] However, only five of the 46 women who did not report any tobacco use but whose cotinine levels were ≥ 15ng/ml had a cotinine level <20ng/ml.

It is important to note that six self-reported tobacco users had a cotinine level below 15ng/mL, a standard cut-off for personal use. Recent work points out that some tobacco users who smoke (or chew) infrequently or have low consumption are likely to have lower cotinine levels, particularly if they did not smoke (or chew) within the preceding 24 hours.[19] These 'false-negatives' are less important because this is a relatively small number of women and because we included all women who reported chewing tobacco as tobacco users, regardless of cotinine level.

To what extent are participants who provided a saliva sample representative of those interviewed? Women who reported no tobacco use who did not give a saliva sample were significantly different in a number of respects from women who reported chewing tobacco and did provide a saliva sample. However, those with no self-reported tobacco use and no saliva data did have a similar profile to those who reported no tobacco use and had a salivary cotinine level of <15ng/ml. This latter group were also significantly different in a number of respects from women who reported chewing tobacco or whose

cotinine levels indicated personal tobacco use. These differences make it less likely that women who were concealing their personal tobacco use chose not to provide a saliva sample. Moreover, it is unlikely that a participant would refuse to provide a saliva sample in an attempt to conceal a false response, as the nurse requested the saliva sample in a separate part of the interview process: at that stage of the interview they did not know that a saliva sample would be requested at a nurse visit, nor what it was for. Very few participants who had a nurse visit refused to provide a saliva sample.

Limitations of this study

Unfortunately, the nature of the data only allows for speculation regarding the discrepancy between self-reported and cotinine validated tobacco users. Moreover, due to the small sample sizes, the findings from this study cannot be generalised beyond the women in this sample. It should also be noted that even though the interview and questionnaire were available in different languages, the translated versions may have had unforeseen limitations. Questionnaires developed for English speakers and subsequently translated into ethnic minority languages can result in measurement error due to inappropriate content, insensitivity, and a general lack of awareness regarding the cultural norms and beliefs of the population under investigation. [20] In spite of these limitations, there are no better data currently available than this national sample. This study is, therefore, a good starting point for this under-researched topic. Further research is needed, however, and a potential source for other nationally representative data is the Department of Health's Direct Enhanced Services (DES) initiative, which focuses on five topics (one of which is ethnicity) related to health and service priorities that will benefit patients.[21] Currently this initiative only focuses on Black minority ethnic patients, and would require that South Asians be included as a target group.

Conclusions

While Bangladeshi women are less likely to smoke compared with the general population, they are much more likely to chew tobacco. There is also a large group who do not report using tobacco but in whom objective data demonstrate personal tobacco use, with its consequent health risks. We found that this latter group (the 'under-

reporters') were not the young, British-born, English-speaking women as we had hypothesised but had similar socio-demographic characteristics to those who reported chewing tobacco. Almost half of the 'under-reporting' Bangladeshi women reported chewing paan without tobacco, which suggests that what they chew does, in fact, contain tobacco.

Regardless of age, sex, and social class, South Asians in the UK are often misinformed and lack awareness of some of the health risks, including oral cancer, associated with using tobacco and chewing paan.[22-23] The findings from this study reveal that there may also be a lack of awareness of the precise constituents being chewed. Clinicians and public health professionals need to increase knowledge among individual patients and communities, particularly community leaders and opinion-formers, using established, effective techniques. Social marketing campaigns will need to focus on paan as well as tobacco consumption and related health risks. Education regarding the harmful effects of tobacco should be complemented by information on identified and non-identified sources of tobacco and by control of sales of illegally imported (untaxed) chewing tobacco in local shops.[24]

Clinicians should also ask South Asian patients, particularly Bangladeshi patients, about paan and other chewed substances. Specialist helplines offering counselling services in different ethnic minority languages are popular and should be expanded to address the issue.

Further investigation is needed to discover whether the under-reporting was concealment or a lack of awareness that the paan they chewed contained tobacco. Assumptions regarding tobacco use among certain ethnic minority groups may not be as straightforward as was once thought.

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Table 1 Characteristics of Bangladeshi women by self-reported tobacco use, salivary cotinine level and presence or absence of a saliva sample

	VALID COTININE SAMPLE							NO COTININE SAMPLE				
	Self-reported Chewing		Self-reported no tobacco use: Cotinine ≥ 15ng/ml		Self-reported no tobacco use: Cotinine <15ng/ml		Signifi-cance [a]	Self-reported Chewing		Self-reported no tobacco use		Signifi-cance [b]
	%	*N*	%	*N*	%	*N*	p	%	*N*	%	*N*	p
Age		*75*		*45*		*182*			*150*		*544*	
Mean (years)	40.2 +++		38.3***		29.2		0.000	43.3		31.1		0.000
Median (years)	38		33		27		0.000	43.5		27		0.000
Religion							0.219					0.327
Muslim	98.7	*74*	100	*45*	100	*182*		99.3	*149*	98.3	*535*	
Country of birth							0.000					0.000
England	1.3 +++	*1*	4.4*	*2*	17.1	*31*		2.7	*4*	22.8	*124*	
Abroad	98.7	*74*	95.6	*43*	82.9	*150*		97.3	*146*	77.2	*420*	
Education							0.000					0.000
Above A level	2.6	*2*	2.2	*1*	8.8	*16*		2.7	*4*	10.8	*59*	
A level	4	*3*	6.7	*3*	14.8	*27*		0.7	*1*	13.2	*72*	
O level / GCSE	6.7	*5*	11.1	*5*	28	*51*		3.3	*5*	21.7	*118*	
Less than O level / GCSE [c]	86. +++7	*75*	80 ***	*36*	48.4	*88*		93.3	*140*	54.2	*295*	
Equivalised Household Income							0.188					0.069
Highest Tertile	4.3	*2*	0	*0*	3	*4*		0.0	*0*	3.4	*13*	
Middle Tertile	2.1	*1*	2.9	*1*	10.5	*14*		3.9	*4*	7.4	*28*	
Lowest Tertile	93.6	*44*	97.1	*33*	86.5	*133*		96.1	*98*	89.2	*339*	
Speaks English							0.000					0.000
Very well [d]	13.7 +++	*10*	13.3 **	*6*	38.2	*60*		4.8	*7*	42.0	*204*	
Fairly well	11	*8*	20	*9*	17.8	*28*		9.6	*14*	19.1	*93*	
Slightly	34.2	*25*	33.3	*15*	29.9	*47*		34.0	*50*	20.8	*101*	
Not at all	41.1	*30*	33.3	*15*	14	*22*		51.0	*75*	18.1	*88*	
Language of Interview							0.000					0.000
Wholly in English [d]	25.3 +++	*19*	26.7 **	*12*	49.5	*90*		14.7	*22*	56.1	*305*	
Partly in English	12	*9*	8.9	*4*	17.6	*32*		16.0	*24*	12.7	*69*	
Wholly in another language	62.7	*47*	64.4	*4*	33	*60*		69.3	*104*	31.3	*170*	
Self-completion booklet completed	33.9 +++	*20*	27.8 ***	*10*	71.5	*113*	0.000	22.4	*26*	68.3	*272*	0.000

	VALID COTININE SAMPLE							NO COTININE SAMPLE				
	Self-reported Chewing		Self-reported no tobacco use: Cotinine ≥ 15ng/ml		Self-reported no tobacco use: Cotinine <15ng/ml		Significance [a]	Self-reported Chewing		Self-reported no tobacco use		Significance [b]
independently												
Chews Paan without tobacco	9.3 ###+	*7*	46.5 **	*20*	22.6	*40*	0.000	6	*9*	19.1	*130*	0.000
Passive smoking exposure at home	53.3 ++	*40*	48.9	*22*	34.1	*62*	0.009	44	*66*	37.7	*205*	0.160
Spouse/partner present during interview	45.8	*27*	50.0	*18.0*	43	*68*	0.736	44.9	*52*	40.2	*160*	0.216
Parent(s) present during interview	5.1 ++	*3*	8.3	*3*	21.5	*34*	0.005	6.9	*8*	25.9	*103*	0.000
Brother(s)/sister(s) present during interview	3.4 +++	*2*	8.3 *	*3*	25.9	*41*	0.000	4.3	*5*	23.6	*94*	0.000
Own/related children present during interview	66.1 +	*39*	63.9	*23*	49.4	*78*	0.047	64.7	*75*	45.7	*182*	0.000
Unrelated adult present during interview	13.6	*8*	25 *	*9*	9.5	*15*	0.040	17.2	*20*	7.5	*30*	0.002

[a] Chi-square test among those with cotinine sample
[b] Chi-square test among those without cotinine sample
[c] Significance comparing education level dichotomised into 'O level or above' with ' less than O level'
[d] Significance comparing language spoken or used for interview across all categories of response
Comparison of self-reported chewing against self-reported no use but cotinine ≥ 15ng/ml: ### p<0.001
Comparison of cotinine ≥ 15ng/ml against cotinine <15ng/ml among those reporting no tobacco use: * p<0.05 ** p<0.01 *** p<0.001
Comparison of self-reported chewing against self-reported no use and cotinine <15ng/ml: + p<0.05 ++ p<0.01 +++ p<0.001

Table 2 Status of tobacco use for Bangladeshi women in England by age, education level, exposure to passive smoking, and chewing paan without tobacco: Multinomial logistic regression analysis (n=302)

	Reference group = Self-reported no tobacco use cotinine ≥15ng/ml (i.e. under-reporters)			
	Self-reported Chewing vs. under-reporters		**Self-reported no tobacco use Cotinine <15ng/ml vs. under-reporters**	
Variable	Odds Ratio	95% Confidence Interval	Odds Ratio	95% Confidence Interval
Age				
16-29	0.70	0.23-2.09	4.51**	1.63-12.45
30-44	0.84	0.32-2.21	1.76	0.68-4.51
Education level				
O level or above	0.67	0.21-2.12	2.63*	1.02-6.81
Passive smoking				
Yes	1.48	0.65-3.37	0.56	0.26-1.18
Chew paan without tobacco				
Yes	0.11***	0.04-0.30	0.42*	0.20-0.89

Note. Nagelkerke R^2=0.323, -2 Log Likelihood=111.061, χ^2=94.312. Reference categories for independent variables: age 45+; education less than O level; no passive smoking; does not chew paan without tobacco.
*p<0.05. **p<0.01. ***p<0.001.