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Social contextual factors and tobacco use among Indian teachers: Insights from the Bihar School Teacher's Study

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Abstract

Tobacco use within India has significant effects on the global burden of tobacco-related disease. As role models and opinion leaders, teachers are at the forefront of tobacco control efforts, yet little is known about their own tobacco use. This study examines the association between factors in the social environment and tobacco use among teachers in Bihar, India. The study was based on the Bihar School Teachers' Study baseline survey. Seventy-two Bihar government schools (grades 8–10) were randomly selected for the study and all school personnel were invited to complete the survey in June/July in 2009 and 2010. We assessed the relation between social contextual factors and current smoking/smokeless tobacco use by fitting a series of logistic regression models. After controlling for clustering of teachers in schools and other covariates, our results showed teachers with one or more coworkers who used tobacco were twice as likely to be smokeless tobacco users

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CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest.

as teachers with no co-workers who used tobacco. Teachers who reported rules prohibiting smoking at home were significantly less likely to smoke than teachers without such rules. Older male teachers also had significantly greater odds of smoking/using smokeless tobacco. These findings provide direction for future interventions targeting the social context.

Keywords

India; social context; tobacco use; schools; teachers; co-workers; family influence

INTRODUCTION

Tobacco use is one of the greatest threats to health in the developing world and reducing its prevalence is a major public health priority (Oppeltz and Jatoi, 2011). Approximately 82% of the world's 1.1 billion smokers are found in low-and middle-income countries (LMICs) and the World Health Organization estimates that by 2030, 80% of the world's 8 million tobacco-related deaths will occur in these countries (Jha et al., 2002; Mathers and Loncar, 2006; World Health Organization, 2008).

Among LMICs, India has one of the highest tobacco use rates, with 48% of men and 20% of women using some form of tobacco (International Institute for Population Sciences, 2010). Smokeless tobacco use is much more common in India than smoking due to cost, convenience and social acceptability, giving rise to high use even among women and young adults (Gupta and Ray, 2003). Additionally, smokeless tobacco may have a longer satisfaction period as blood cotinine level tapers off more slowly after smokeless tobacco use compared to smoking (Benowitz, 1992) and higher oral gratification, because it is chewed or sucked over a longer period than smoked tobacco, particularly bidi that is smoked within a short amount of time.

More than one million people were predicted to die from tobacco-related diseases in India in 2010 and this number is expected to increase in the future (Jha et al., 2008). Accordingly, almost half of the total cancer incidence for men and 20% of that for women is related to tobacco (Sharma, 1998; Stewart and Kleihues, 2003). Having multiple forms of tobacco in use, limited resources for cessation and few social norms to support quitting in India (Singh, 2013; Sorensen et al., 2013) provides challenges for reducing these daunting numbers.

To better understand tobacco use is to view it within a complex interchange of sociocultural factors (Reddy and Gupta, 2004). Globally, factors in the social environment found to be related to tobacco use predominantly point to the influence of friends and family members (David A et al., 2010; Paul et al., 2010). Additionally, the acceptance of smoking in the home has been shown to be closely related to tobacco behavior of family members (Paul et al., 2010). Relationships with co-workers are also pivotal, which can influence tobacco use patterns in both positive and negative ways (Rosenthal et al., 2012; Sorensen et al., 2004; Sorensen et al., 2005a; Sorensen et al., 2009), (Surani et al., 2013).

Teachers represent a priority population for tobacco control efforts in many LMICs because they are role models for students and influential members of society, capable of influencing

both policies and social norms related to tobacco control (Gajalakshmi et al., 2012; Nagler et al., 2013; Pischke et al., 2012; Sorensen et al., 2005a; Sorensen et al., 2005b). However, tobacco use among teachers is high in some parts of India. According to the 2000 Global School Personnel Survey (GSPS), 78% of Bihar teachers used some form of tobacco (Sinha et al., 2002). Later GSPS data in 2006 showed nearly 40% of teachers in the eastern region of India, which includes Bihar among other states, used some form of tobacco, (Sinha, 2006), indicating that even with the introduction and increasing enforcement of tobacco legislation and initiatives in India since 2003, rates still remain high in this influential group (Kaur and Jain, 2011).

The purpose of this study is to explore the association between social contextual factors and current smoking and smokeless tobacco use among teachers in the Indian state of Bihar. The Social Contextual Model of Health Behavior Change was used as a theoretical framework to guide how we organized potential determinants of tobacco use according to their level of influence and formulate our research questions (Figure 1) (Nagler et al., 2013; Sorensen et al., 2004; Sorensen et al., 2003). The model defines the social context as including life experiences, social relationships, organizational structures and societal influences, which can be operationalized as either *mediating mechanisms* or *modifying conditions*. Mediating mechanisms are factors found on the pathway between an intervention and the outcomes, while modifying conditions are factors found in the social environment that can independently affect outcomes, but which are not influenced by a given intervention. Accordingly, this framework allowed us to explore the role of modifying conditions at the individual-level (material circumstances), interpersonal-level (friends, household members and co-workers who use tobacco, along with rules regarding smoking at home) and organizational factors (school tobacco control policies).

METHODS

Study Design

The data presented here are from the Bihar School Teachers' Study (BSTS) baseline teachers' survey. BSTS was designed to assess the extent to which a comprehensive schoolbased tobacco control intervention resulted in tobacco use cessation among teachers and implementation of school tobacco control policies, using a cluster randomized-controlled design. At the conclusion of the intervention, 50% of teachers in the intervention group quit tobacco use compared to 15% in the control group; nine-months later, more than twice as many users in the intervention group quit tobacco use compared to the control (19% vs. 7%) (Sorensen et al., 2013).

Study Setting, Population and Sample

Bihar is located in northeast India with a population of approximately 83 million (Government of India, 2001). At the time BSTS was initiated, Bihar had far fewer resources and social infrastructure on a broad range of indicators of socio-economic wellbeing than most other states in India. For example in 2001, only 10% of Bihar households had electricity compared to the national average of 56% (Government of India, 2001). Bihar is a major tobacco producing state and had a higher prevalence of tobacco use compared to other

states, with 66% of men in Bihar reporting tobacco use in 2009–2010, compared to the national average of 50% (International Institute for Population Sciences, 2010; World Health Organization and Representative to India, 2004).

For BSTS, we randomly selected 72 rural and urban government schools serving grade levels 8–10 from within 10 school districts in Bihar. Eligible schools had 8 or more teachers and were not located in flood zones. Study participants included 755 teachers and other school personnel. All teachers were educated and had secure employment by the government.

Data collection

We created a survey and used validated measures from India, such as those included on the National Family Health Survey-3 (NFHS-3) and GSPS. We also did cognitive testing of the survey with teachers not enrolled in the study, prior to administration, to ensure teachers' comprehension of the questions asked. Surveys were conducted at the beginning of the school year (June–July) in 2009 and 2010. We trained staff as survey administrators who visited each school at a date/time arranged by the principal. All school personnel - including teachers, clerks and the principal - who were present on the day of survey administration were invited to participate in the survey. The survey was self-administered in Hindi, the local language in Bihar, and took approximately 30–45 minutes to complete. We took great efforts to minimize social desirability bias by informing teachers their survey responses would never be linked with their name and that only aggregate data would be published.

Measures

Outcomes—We measured current tobacco use by asking: ‘Do you currently use any smokeless tobacco products (includes chewing tobacco such as tobacco leaf, tobacco leaf and lime-khaini/ surti/sada, gutka, panmasala with zarda or pan with zarda; applying tobacco such as gul, gudaku, tobacco tooth paste-dentobac etc, tobacco tooth powder & snuff such as nas)?’ and ‘Do you currently smoke tobacco in any form, such as bidi, cigarette, hukka, cigar or pipes?’ Responses were used to create three-categories – smokers, smokeless tobacco users, and non-users. We combined those who smoked with those who replied that they smoked and used smokeless tobacco products into the ‘smokers’ category, due to the low number of smokers. ‘Smokeless tobacco users’ were teachers who only used smokeless products. ‘Non-users’ were teachers who did not use any tobacco products.

Individual factors: We adapted NFHS-3 to assess *material circumstances* by asking about nine indicators of financial resources (International Institute for Population Sciences, 2005–6). The material possession of specific items is often used as an indicator of economic status of the household in India. We focused this paper on the two indicators that provided the greatest amount of variability among respondents: if the teacher or their family had a motorized vehicle (moped/scooter/motorcycle/car) or a refrigerator. Responses were used to create three categories: (1) neither motorized vehicle or refrigerator; (2) either motorized vehicle or refrigerator, but not both; and (3) both motorized vehicle and refrigerator.

Interpersonal factors: *Friends who use tobacco* was assessed by asking teachers how many of their five closest friends or acquaintances they spend time with on a regular basis use tobacco. Teachers were also asked about the number of *co-workers who use tobacco* and the number of *adult household members* (including themselves) who use tobacco products. For the household member variable, we subtracted 'one' if the teacher was a tobacco user. Additionally, we asked teachers about *rules regarding smoking cigarettes or bidis* (unfiltered cigarettes) *inside at home*, with the answer categories of: smoking is not allowed in any room inside my home; smoking is allowed only in some rooms inside my home; no rules or restrictions.

Organizational factors: We adapted the GSPS questions about *school tobacco control policies* and asked teachers if tobacco could be bought within 100 yards of their school; if the school had a policy or rule specifically prohibiting smoking and smokeless tobacco use inside school; if a policy or rule about tobacco use applied to the entire school or only some areas; if there were any signs posted in the school warning tobacco use is not allowed; and how well the school enforced any of its policies (or rules) on tobacco use (Sinha et al., 2007).

Sociodemographic factors: Socio-demographic variables were measured using standard items, including gender, marital status, religion, education and age. We classified the schools as rural or urban based on the Bihar Department of Education designation.

Statistical Analysis

To examine the association between the factors in our conceptual framework and current smoking and current smokeless tobacco use we used logistic regression analyses. We first tested the association between each social contextual measure alone with tobacco use status. To understand the interrelationships among the several measures of each level of influence (individual, interpersonal, organizational and sociodemographic) we computed a multivariable analysis for each level of influence by including all the variables in that level. From these analyses, we selected variables that were statistically significantly associated with either smoking or smokeless tobacco use ($p < 0.10$) and computed the same multivariable analysis for each outcome. We retained the same variables in both models to compare odds ratios and so that all associations would be adjusted for the same covariates. In all analyses, we controlled for school as a random effect to account for the clustering of teacher responses within schools. All data analyses were conducted using the personal computer version of SAS (v.9.3).

RESULTS

Characteristics of the population

Of the 947 eligible participants, 755 completed the baseline survey (80% response rate). Among those, 495 (66%) were men (Table 1). Approximately 88% of the teachers were married, 88% were Hindu, 83% had a college education or higher and 58% were employed in urban schools. Over 28% of the teachers were smokeless tobacco users and 7% either smoked or both smoked and used smokeless tobacco products. In data not shown,

approximately 14% of teachers primarily used paan with tobacco, followed by almost 13% using khain or lal dantamanjan. For smokers, 3% primarily smoked cigarettes and 6% smoked some other form of tobacco.

Social contextual factors and tobacco use

Table 2 presents the characteristics of teachers and other school personnel who responded to the baseline survey by tobacco use status, controlling for the clustering of teachers in schools. Both smokers and smokeless tobacco users were more likely to be men, be older, report having friends and co-workers who used tobacco and were less likely to report their homes had rules that prohibited smoking compared to non-users. Additionally, smokers were more likely to have household members who used tobacco products and report having fewer material circumstances than non-users. Smokeless tobacco users were more likely to report being married and were more likely to report that a policy or rule about tobacco use applied to their entire school or some areas of it.

We then computed a multivariable model for each level of influence including all the level-specific variables (data not shown). Controlling for other factors in each model, at the individual-level, material circumstances remained significantly associated with smoking. Among the interpersonal factors, having one or more co-workers who use tobacco and having more than one friend who used tobacco were significantly associated with greater odds of being a smokeless tobacco user. Having rules regarding smoking at home was also significantly associated with smoking. At the organizational-level, believing the school's tobacco control policy was completely or partially enforced was significantly associated with greater odds of being a smoker. Among the socio-demographic factors, older age and being male remained significantly associated with greater odds of both smoking and smokeless tobacco use.

In our final models, we entered the same variables in both models: material circumstances, friends who use tobacco, co-workers who use tobacco; smoking rules at home; enforcement of the school's tobacco policy; age; and gender (Table 3). After controlling for school and the other variables in each model, teachers who reported having more than one co-worker who used tobacco had 2.2 greater odds (95% CI=1.25–3.97) of being a smokeless tobacco user as compared to those who reported having no co-workers who used tobacco. Furthermore, those who reported having smoking rules at home were only 0.41 times as likely to be a smoker (95% CI=0.19–0.89), compared to teachers who lived in households where smoking was allowed or had no rules against it. Each additional 10 years of age was associated with 1.59 times the odds of being a smokeless tobacco user (95% CI=1.29–1.97) and 1.75 times the odds of being a smoker (95% CI=1.22–2.51). Finally, men were 4.69 times more likely to use smokeless tobacco products (95% CI=2.76–7.96) and had 12.22 greater odds of being a smoker (95% CI=2.72–54.86), compared to women.

DISCUSSION

The social context matters for teachers' tobacco use in Bihar, both at school and at home. In this study, we sought to better understand how factors in the social environment were associated with teachers' smoking and smokeless tobacco use. We learned teachers who

reported having one or more coworkers who used tobacco were twice as likely to be a smokeless tobacco user than teachers who reported no co-workers who used tobacco. Prior research highlights the central role of the work context (Sorensen et al., 2009) and the influence of co-workers in tobacco use (Rosenthal et al., 2012; Sorensen et al., 2004; Sorensen et al., 2009). Co-worker discouragement of quitting may contribute to an individual workers' reduced confidence in quitting (Sorensen et al., 1986). Given limited awareness of the harmful effects of smokeless tobacco and little social pressure against use, coworker consumption could have an even stronger influence (Raute et al., 2011; Sinha et al., 2004). In focus groups our research team conducted with teachers in Maharashtra and Bihar, we found teachers were more knowledgeable about the health hazards of smoking than they were about the hazards of smokeless tobacco (Sorensen et al., 2005a). Another study found some patients with tuberculosis in Karnataka switched from smoking to smokeless as a form of harm reduction (Deepak et al., 2012). Others have noted that smokeless tobacco has increased in prevalence given the increased awareness of the hazards of smoking, along with aggressive marketing by some smokeless tobacco manufacturers (Priya and Lando, 2014).

We also found teachers who reported having rules that prohibit smoking at home were significantly less likely to smoke. These rules may be another indication of social norms related to tobacco use. If family members smoke, they may be less likely to have a rule that restricts it. This finding is consistent with studies that have explored the relationship between tobacco use in families and tobacco behavior of individual members. For instance, Gupta and colleagues identified the potential influence of elders in supporting cessation among other family members (Gupta et al., 1995) They also found if men used tobacco, they would not encourage family members to use. They concluded the role of the family is to encourage quitting and not promote use. Culturally, while a wife may not approve of her husband's tobacco use, she will never confront him in front of other people but convey this in a sensitive way in private. Children and grandchildren also have special rights in the family and can convey their displeasure with a family member's tobacco use in a variety of ways.

Overwhelmingly we found that being male and older age were significantly associated with greater odds of being a smoker or smokeless tobacco user. Similar results were shown in a recent study that examined tobacco use by gender and age in a large sample derived from the Global Adult Tobacco Survey of India in 2009–2010 (Prabhakar et al., 2012).

Given the influence of friends, we would have expected friends' tobacco use to be significantly associated with tobacco use among teachers. However, this was not the case. Teachers may spend more time with co-workers than friends given the number of hours they spend each day at school; their coworkers may also be their friends, making it difficult to distinguish between the two. While we did not measure time spent with family members, friends or colleagues who use tobacco, future investigations may want to explore this further.

Our study revealed a lower prevalence of tobacco use than rates reported in GSPS in 2006. Since the baseline surveys, there have been vast improvements in tobacco control in India,

which have affected every state including Bihar. In particular, the World Health Organization Framework Convention on Tobacco Control has been ratified, a comprehensive tobacco control law Cigarette and other Tobacco Products Act (COTPA) has been passed with the important components publicized, and all these have garnered a substantial amount of media coverage and general awareness on tobacco control. Presumably these developments have affected tobacco use prevalence (Yadav et al., 2013).

To our knowledge, this study is one of the first to explore the relationship between factors in the social environment at multiple levels of influence and tobacco use among teachers in India. The schools in our study were randomly selected within 10 districts across the state of Bihar and we controlled for the clustering of teacher responses in all analyses. This is a relatively homogenous group of teachers who enjoy a special respect afforded them by society. We also had a high response rate to the survey and used validated measures from India, such as those included on the National Family Health Survey and GSPS.

Despite these strengths, there are limitations to this study. All data - including tobacco use - were self-reported, which are subject to reporting bias. However, data were collected before the intervention began, and therefore were not influenced by any intervention messages. Furthermore, the data are cross-sectional precluding any conclusions about temporality or causation. There may also be unmeasured variables from the Social Contextual Model of Health Behavior Change framework, which may have further contributed to the teachers' tobacco use patterns. Because teachers' coworkers may have also been their friends, these two variables may have been conflated. Additionally, there is a great deal of variability in the type of tobacco used and prevalence differs greatly from state to state. Thus caution needs to be exercised while extrapolating results to other states in India.

Given the strong association between teachers' tobacco use and that of their work colleagues and household environments, these insights offer valuable future opportunities for both researchers and practitioners. Health is increasingly being seen as a collective phenomenon, with the ability of social relationships to influence health in both positive and negative ways (Christakis and Fowler, 2008; David A et al., 2010; Fowler and Christakis, 2008; Tamers et al., 2013). With the prevailing tradition of Indian cultural collectivism (Chadda and Deb, 2013), future interventions that target social networks hold promise for this country and others with similar cultures. Teachers who quit could be identified as 'champions' to promote cessation among tobacco users in their networks of friends, family and community members (Valente, 2012); they can also be important role models for youth by abstaining from tobacco and opinion leaders in communities to modify social norms in favor of tobacco abstinence..

In conclusion, this study contributes to our growing understanding of the social context of tobacco use in LMICs and provides further evidence of how tobacco use is intimately woven into the social fabric of India (Sorensen et al., 2005a). Recognizing that teachers are a highly educated group with much social capital and influence in Indian society, we can leverage this knowledge to inform future interventions that engage teachers to become champions of change within their own social networks. By equipping them with the knowledge, skills, and self-efficacy to change social norms related to tobacco use and navigate complex

interpersonal relationships, they can ultimately be key drivers in reducing the tobacco burden in LMICs.

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Highlights

- Teachers are central to tobacco control efforts in low-and middle-income countries.
- Our study examined teachers' tobacco use in India.
- Teachers with coworkers who used tobacco were more likely to use smokeless tobacco.
- Teachers living in smoke-free homes were significantly less likely to smoke.
- Older male teachers had significantly greater odds of smoking/smokeless tobacco use.

FIGURE 1.

Conceptual framework for examining the association between social contextual factors and tobacco use among teachers in Bihar, Bihar, India. June/July 2009 and 2010

TABLE 1

Selected characteristics of teachers and other school personnel completing the Bihar School Teachers Study (BSTS) baseline survey (n=755). Bihar, India. June/July 2009 and 2010

Demographics	N=755 No. (%) or Mean (SD)
Occupation	
Principal / Headmaster	65 (8.6%)
Teacher	648 (85.8%)
School health services personnel	2 (0.3%)
Clerical Staff	36 (4.8%)
Other type of school personnel	4 (0.5%)
Gender	
Male	495 (65.6%)
Female	260 (34.4%)
Marital Status	
Married	668 (89.2%)
Divorced or Separated	3 (0.4%)
Widowed	29 (3.9%)
Single	49 (6.5%)
Religion	
Hindu	664 (88.5%)
Other	86 (11.5%)
Education	
Higher Secondary or Less	128 (17.0%)
College	373 (49.7%)
More than College	250 (33.3%)
Urban/Rural	
Rural	315 (41.7%)
Urban	440 (58.3%)
Age (years)	45.9 ($\pm$ 10.31)
Tobacco Type Used	
No use	487 (64.5%)
Smokeless only	214 (28.3%)
Smoking only	8 (1.1%)
Both smokeless and smoking	46 (6.1%)

TABLE 2
Selected characteristics by tobacco use status, Bihar, India, June/July 2009 and 2010

Characteristic	Smokers (N=54) No. (%) or Mean (SD)	Smokeless Only (N=214) No. (%) or Mean (SD)	non-Users (N=487) No. (%) or Mean (SD)	Smokers vs. non-users p-Value ¹	Smokeless only vs. non- users p-Value ¹
Individual Factors					
Material Circumstances				0.0102	0.22
Neither motor vehicle or fridge	11 (25.0%)	58 (29.3%)	111 (24.6%)		
Either motor vehicle or fridge but not both	23 (52.3%)	77 (38.9%)	159 (35.2%)		
Both motor vehicle and fridge	10 (22.7%)	63 (31.8%)	182 (40.3%)		
Interpersonal Factors					
Friends who use tobacco				0.0057	<.0001
None	5 (9.4%)	29 (13.6%)	175 (36.5%)		
1 or more	48 (90.6%)	185 (86.4%)	305 (63.5%)		
Co-Workers who use tobacco				0.0045	<.0001
None	4 (7.4%)	26 (12.3%)	171 (35.3%)		
1 or more	50 (92.6%)	186 (87.7%)	313 (64.7%)		
Household members who use tobacco				0.049	0.79
No household members use	32 (64.0%)	162 (76.8%)	365 (77.8%)		
One household or more member uses	18 (36.0%)	49 (23.2%)	104 (22.2%)		
Rules regarding smoking at home				0.0022	0.045
Smoking is not allowed	29 (53.7%)	148 (69.5%)	367 (76.5%)		
Smoking is allowed or no rules	25 (46.3%)	65 (30.5%)	103 (23.5%)		
Organizational Factors					
Can tobacco be bought within 100 yds of school?				0.36	0.89
Yes	18 (33.3%)	65 (30.5%)	137 (28.2%)		
No or don't know	36 (66.7%)	148 (69.5%)	349 (71.8%)		
Does your school have a policy or rule specifically prohibiting smokeless tobacco use inside school?				0.63	0.36
Yes	22 (41.5%)	99 (46.5%)	216 (44.8%)		
No	31 (58.5%)	114 (53.5%)	266 (55.2%)		
Does your school have a policy or rule specifically prohibiting smoking inside school?				0.52	0.12

Characteristic	Smokers (N=54) No. (%) or Mean (SD)	Smokeless Only (N=214) No. (%) or Mean (SD)	non-Users (N=487) No. (%) or Mean (SD)	Smokers vs. non-users p-Value ^f	Smokeless only vs. non- users p-Value ^f
Yes	23 (42.6%)	110 (51.6%)	220 (45.7%)		
No or don't know	31 (57.4%)	103 (48.4%)	261 (44.3%)	0.51	0.05
Does a policy or rule about tobacco use apply to the entire school or only in some areas?					
Entire school	18 (33.3%)	106 (49.8%)	208 (43.2%)		
Some areas	5 (9.3%)	24 (11.3%)	42 (8.7%)		
No policy or don't know	31 (57.4%)	83 (39.0%)	232 (48.1%)	0.88	0.59
Are any signs posted in your school warning that tobacco use is not allowed?					
Yes	8 (14.8%)	28 (13.1%)	67 (13.8%)		
No or don't know	46 (85.2%)	185 (86.8%)	419 (86.2%)	0.09	0.36
How well does your school enforce any of its policies (or rules) on tobacco use?					
Completely enforced	17 (32.1%)	81 (38.0%)	177 (37.7%)		
Partially enforced	12 (22.6%)	36 (16.9%)	60 (12.8%)		
No Policy or not at all enforced	24 (45.3%)	96 (45.1%)	232 (49.5%)	0.0002	<.0001
Sociodemographic Factors					
Gender					
Male	48 (88.9%)	186 (86.9%)	261 (53.6%)		
Female	6 (11.1%)	28 (13.1%)	226 (46.4%)	0.98	0.048
Marital Status					
Not Married	6 (11.3%)	16 (7.5%)	59 (12.2%)		
Married	47 (88.7%)	197 (92.5%)	424 (87.8%)	0.21	0.12
Religion					
Hindu	44 (83.0%)	198 (92.5%)	422 (87.4%)		
Other	9 (17.0%)	16 (7.5%)	61 (12.6%)	0.70	0.46
Education					
Secondary or less	12 (23.1%)	36 (16.8%)	80 (16.5%)		
College	25 (48.1%)	107 (50.0%)	241 (49.7%)		
More than College	15 (28.8%)	71 (33.2%)	164 (33.8%)	0.20	0.26
Urban/Rural					
Rural	28 (51.9%)	99 (46.3%)	188 (38.6%)		

Characteristic	Smokers (N=54) No. (%) or Mean (SD)	Smokeless Only (N=214) No. (%) or Mean (SD)	non-Users (N=487) No. (%) or Mean (SD)	Smokers vs. non-users p-Value ^f	Smokeless only vs. non- users p-Value ^f
Urban	26 (48.1%)	115 (53.7%)	299 (61.4%)		
Age	48.9 (10.75)	47.9 (9.36)	44.7 (10.47)	0.0033	< 0.0001

^f p-values controlling for nesting of teachers in schools

Final models of the association between social contextual factors and tobacco use, controlling for school. Bihar, India. June/July 2009 and 2010

TABLE 3

	Smokeless Only (vs non-User)			Smoker (vs non-User)		
	OR	Lower	Upper	OR	Lower	Upper
Individual Factors						
Material Circumstances						
Both motor vehicle and fridge (VS Neither motor vehicle or fridge)	0.882	0.516	1.508	0.899	0.302	2.673
Either vehicle or fridge but not both (VS Neither motor vehicle or fridge)	0.850	0.517	1.398	1.979	0.803	4.875
Interpersonal Factors						
Friends who use tobacco						
One or more (VS None)	1.600	0.918	2.789	1.570	0.512	4.814
Co-Workers who use tobacco						
One or more (VS None)	2.224	1.246	3.968	2.121	0.622	7.239
Smoking rules at home						
No smoking allowed (VS Smoking allowed / No rules against)	0.641	0.405	1.014	0.413	0.193	0.887
Does tobacco policy apply to entire school or only in some areas?						
Policy is completely enforced (VS No tobacco use policy / Not enforced)	1.412	0.895	2.229	1.133	0.490	2.619
Policy is partially enforced (VS No tobacco use policy / Not enforced)	1.079	0.591	1.968	1.689	0.653	4.368
Sociodemographic Factors						
Gender						
Male (VS Female)	4.689	2.763	7.959	12.219	2.721	54.860
Age (by decade)	1.594	1.287	1.973	1.750	1.219	2.510