

Influence of Parental Smoking on Smoking Habit of Bangladeshi Adult Population in Rural and Urban Areas

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Abstract

Aim: *To examine whether smoking status of adult Bangladeshis was influenced by their parental smoking behaviour.*

Study design: *Descriptive cross sectional study.*

Place and duration of study: *A community-based study was conducted in urban and rural areas of Bangladesh during the period from 2001 to 2003.*

Methodology: *Data of the cross-sectional study involving 35,446 (16,196 males and 19, 250 females) adults in urban and rural Bangladesh were analyzed in 2007. Data were collected on their smoking pattern and parents' smoking habit by interview.*

Results: *Among the total study subjects, 67.8% and 15.2% reported that their fathers and mothers smoked, respectively, and 14% reported that both parents smoked. In both sexes, current smokers and ever smokers were more often found among respondents when both parents smoked. Smoking was also higher than expected if one parent smoked; this was especially true, for father and son and mother and daughter combinations. The mean (SD) reported age of commencing smoking was 17.8 (5.0) years. Both males and females started smoking at an earlier age if both their parents smoked, compared with only one parent smoking.*

Conclusion: *Parental smoking influences smoking habit and age of starting to smoke of their offspring. Future prevention programs might need to give special attention to the individuals having smoking parents.*

Keywords: Influence, parental smoking, adult population, Bangladesh

1. Introduction

Cigarette smoking is the major single known cause of non-communicable diseases, such as cancer and cardiovascular diseases. Most people try their first cigarette and become daily smokers as adolescents (Giovino, 2002). People who start smoking before 15 years of age have double the risk of developing lung cancer than those who start after the age of 20 years (Kuper et al., 2002).

Parental smoking has been found to associate with increased likelihood of initiation of smoking in childhood (O'Loughlin et al., 1998; Rosendahl et al., 2003), but the association differs with sex of the parent and tobacco product. The paternal use of snus (oral snuff) was associated with boys' current use of the same tobacco product in Sweden. Maternal cigarette smoking was associated with a more than two-fold increase in the risk of current smoking (Rosendahl et al., 2003). Smoking by others in the social environment remains an important influence for smoking progression (Scragg & Glover, 2007). Parental smoking is a consistent risk factor for adolescent smoking in all ethnic groups (Scragg et al., 2003).

Parental behaviour is a key determinant of smoking by New Zealand adolescents. Efforts that target the role of parents should be pursued, such as health promotion strategies that advise parents about the possible benefits of banning smoking (Rainio et al., 2008). Association between parental and child smoking persisted strong and mainly similar over time (Otten et al., 2007). Parental smoking status was not only predictive of transitions from never smoking to trying smoking, monthly smoking, or daily smoking, but also of the progression from trying smoking to daily smoking. Further, although parental former smoking was weaker associated with progressive adolescent smoking transitions than current parental smoking, however absence of parental smoking history was most preventive (Rudatsikira et al., 2008). These associations are mostly observed in countries following western culture; knowledge about the situation in Asian countries is limited. No such study has tested the association in Bangladeshi population although in Bangladesh smoking is a long standing problem. To formulate an effective control program the understanding about different influencing factors like parental smoking is required. This paper examined whether parental smoking associated with age at initiation of smoking of offspring.

2. Materials and Methods

The previous paper of this series has already detailed out the method followed (Flora et al., 2009). Briefly, three annual cross-sectional studies were conducted between 2001 and 2003 in an urban (Mirpur, Dhaka City) and rural area (Kaliganj sub-district), which were selected to represent general urban and rural Bangladesh. Every alternate household which had at least one male and one female adult were recruited. A pre-tested structured questionnaire (in Bangla) was used for interviewing the respondents. In addition to their smoking habit, parental smoking history was also explored. The smoking status of the respondents was categorized into current smoker (those who smoked daily at the time of the data collection), past smoker (who had stopped smoking before the data collection period but used to smoke daily previously), occasional smoker (who smoked from time-to-time) and never smoker (who never ever smoked). A parent was defined as smoker if s/he smoked daily at the time of the data collection or in the past. Verbal consent was obtained from every respondent and interviews were held in private. Ethical clearance was obtained from the Institutional Ethical Committee.

The analyses were carried out primarily using the Statistical Package for Social Sciences (SPSS) version 14.0. Data were weighted to account for the age distribution, gender and locality stratification. Differences which might be attributed to three different surveys were also adjusted during analyses. Uni-variate analyses such as χ^2 test, Student's t-test and one way ANOVA were used to determine the association between exposure and outcome variables along with statistical modelling. A result was considered significant at a p value level <0.05 but given the large sample sizes a more stringent cut-off of $p < 0.01$, or less, was usually used. In addition to p-value, 95% confidence intervals of different estimates were also given to show the range of values of the test statistic.

3. Results

Background characteristics

The socio-demographic status of the respondents was described in an earlier paper (Flora et al., 2009). Table 1 compares the profiles of the 16,196 male and 19,250 female respondents. Males and females were recruited with a same ratio from rural and urban areas. Overall, males were significantly older than females with higher male percentages in the 50 years and above groups. There was no significant difference in religious allegiance by gender. There was a much higher percentage of women who were widowed or divorced, and a higher percentage of unmarried men. Males tended to have a higher level of education than females, particularly at the higher and secondary levels. As would be expected occupation showed marked gender differences with 4 out of 5 females in non-paid (housework) work compared with about 1 in 12 males. About a quarter of the male sample was working as farmers or in the services while 1 in 5 was in business. These differences were accounted in further analyses.

Table 1: Background characteristics of the study sample

Variables	Sex		Total	p-value
	Male	Female		
	n (%)	n (%)	n (%)	
Area				
Rural	8229 (45.5)	9851 (54.5)	18080 (51.0)	ns
Urban	7967 (45.9)	9399 (54.1)	17366 (49.0)	
Age in Years				
<20	1549 (9.6)	2238 (11.6)	3787 (10.7)	<0.001
20-29	4200 (25.9)	6824 (35.5)	11024 (31.1)	
30-39	3972 (24.5)	3886 (20.2)	7858 (22.2)	
40-49	2518 (15.5)	3376 (17.5)	5894 (16.6)	
50-59	1760 (10.9)	1748 (9.1)	3508 (9.9)	
60-69	1254 (7.8)	857 (4.4)	2111 (6.0)	
70 & above	944 (5.8)	320 (1.7)	1264 (3.5)	
Religion				
Islam	15070 (93.1)	17931 (93.2)	33001 (93.1)	ns
Hinduism	898 (5.5)	1050 (5.4)	1948 (5.5)	
Christianity	225 (1.4)	266 (1.4)	491 (1.4)	
Marital Status				
Married	12195 (75.3)	15557 (80.8)	27752 (78.3)	<0.001
Unmarried	3887 (24.0)	2252 (11.7)	6139 (17.3)	
Widow/ Divorced	115 (0.7)	1439 (7.5)	1554 (4.4)	
Educational Status				
No Schooling	3973 (24.6)	6436 (33.4)	10409 (29.4)	<0.001
1-5 yrs of Schooling	314 (19.4)	4507 (23.4)	7648 (21.6)	
6-10 yrs of Schooling	5396 (33.3)	6390 (33.3)	11786 (33.3)	
Higher Secondary +	3671 (22.7)	1908 (9.9)	5579 (15.7)	
Occupation				
Non-paid	1326 (8.4)	16022 (85.1)	17348 (50.1)	<0.001
Students	1157 (7.3)	1018 (5.4)	2175 (6.3)	
Manual Labourer	800 (5.1)	53 (0.3)	853 (2.5)	
Farmer	4197 (26.6)	10 (0.1)	4207 (12.2)	
Skilled Labourer	935 (5.9)	261 (1.4)	1196 (3.5)	
Business	3456 (21.9)	274 (1.5)	3730 (10.8)	
Service/ Professionals	3909 (24.8)	1191 (6.3)	5100 (14.6)	

Parental smoking status

In this study, 31% individuals stated that their parents never smoked and 14% reported that both of their parents used to smoke. Data revealed that 67.8% and 15.2% had smoker fathers and smoker mothers, respectively. Parental smoking status was categorized into four groups, “Both Parent Smoker”, “Only Father Smoker”, “Only Mother Smoker” and “None Smoker”. Smoker parents were more common among the rural respondents than their urban counterparts (Table 2). After correcting for other variables rural counterparts were seventeen and ten times more likely to have smoker mother and both parent smoker, respectively than their urban counterparts. Fathers’ smoking status did not vary with localities.

Table 2: Parental smoking status in different localities

Parental smoking	Urban	Rural	Total	Un-standardized OR	Standardized OR
None	6258 (36.1)	4485 (25.6)	10743 (30.8)	1	1
Only Father	10514 (60.6)	8376 (47.8)	18890 (54.2)	1.1(1.1-1.2)	1.1 (1.0-1.1)
Only Mother	34 (0.2)	451 (2.6)	485 (1.4)	18.5 (13.0-26.3)	17.7 (12.4-25.1)
Both Smoker	542 (3.1)	4213 (24.0)	4755 (13.6)	10.8 (9.8-11.9)	10.1 (9.2-11.2)

Influence of parental smoking status

Of the total respondents, 20.5% were current smokers and 8.1% and 4.5% were past and occasional smokers, respectively. More respondents were likely to smoke (31.7%) if both of their parents used to smoke (Table 3). Moreover, smoking was also higher than expected if one parent smoked; this was especially true, for father and son (46.6%) and mother and daughter (5.9%) combinations. Non-smoker parents were more likely to have non-smoker offspring.

Table 3: Influence of parental smoking on the smoking status of the offspring

Parental Smoking	Smoking Status of the Offspring								p-value*
	Never Smoked		Current Smoker		Past Smoker		Occasional Smoker		
	n	%	n	%	n	%	n	%	
Overall Influence									
None Smoker	8390	78.1	1209	11.3	618	5.8	514	4.8	<0.001
Only Father Smoker	12352	65.4	4334	23.0	1253	6.6	941	5.0	
Only Mother Smoker	288	59.4	108	22.3	81	16.7	8	1.6	
Both Parent Smoker	2325	48.9	1509	31.7	789	16.6	130	2.8	
Influence on Son									
None Smoker	2134	50.6	1134	26.8	479	11.3	479	11.3	<0.001
Only Father Smoker	2885	31.9	4221	46.6	1081	11.9	871	9.6	
Only Mother Smoker	59	27.8	92	43.4	54	25.5	7	3.3	
Both Parent Smoker	633	25.4	1296	52.1	447	18.0	113	4.5	
Influence on Daughter									
None Smoker	6256	96.2	75	1.2	139	2.1	35	0.5	<0.001
Only Father Smoker	9467	96.3	113	1.2	172	1.8	70	0.7	
Only Mother Smoker	229	83.8	16	5.9	27	9.9	1	0.4	
Both Parent Smoker	1692	74.7	213	9.4	342	15.1	17	0.8	

*p-value are obtained from χ^2 -test

The binary logistic regression models were constructed to examine the effect of parental smoking on current smoking and ever smoking status (those who had smoked at sometime in their life, daily or occasionally) after adjusting for the socio-demographic variables and survey differences. The model revealed similar findings (Table 4). Overall, one parent smoking showed about two times higher influence while both parents smoking had about two and half times higher influence on current smoking than none parent smoked. Smoker fathers had shown three times higher influence on current smoking habit of son, either alone or together with mother, while daughters were three times more likely to currently smoke if both of their parents smoked. The influence of mothers' smoking habit was also marked (OR 1.81; 95% CI [1.01- 3.24]). The ever smoking status was more likely to be influenced by the parental smoking. Respondents with 'only fathers', only mothers' and both parents' smokers were 2.4, 3.2 and 4.7 times, respectively, more likely to be ever smoker than never smoker. In both sexes, ever smoking was most likely if both parents smoked and then, if only mothers smoked.

Table 4: Influence of parental smoking on the smoking status of the offspring adjusted for the socio-demographic variables

Parental Smoking	Current Smoker*			Ever Smokers*		
	p-value	Odds Ratio	95% CI for Odds Ratio	p-value	Odds Ratio	95% CI for Odds Ratio
<i>Overall Influence</i>						
None Smoker*		1	1		1	1
Only Father Smoker	<0.001	2.27	2.09 – 2.47	<0.001	2.40	2.22 - 2.59
Only Mother Smoker		1.83	1.39 – 2.40		3.15	2.41 - 4.11
Both Smoker		2.72	2.44 – 3.03		4.72	4.23 - 5.27
<i>Influence on Son</i>						
None Smoker*		1	1		1	1
Only Father Smoker	<0.001	2.41	2.21 – 2.62	<0.001	2.87	2.64 - 3.13
Only Mother Smoker		1.67	1.24 – 2.24		2.92	2.09 - 4.07
Both Smoker		2.39	2.13 – 2.68		3.50	3.08 - 3.97
<i>Influence on Daughter</i>						
None Smoker*		1	1		1	1
Only Father Smoker	<0.001	1.46	1.07 - 1.99	<0.001	1.42	1.18 - 1.70
Only Mother Smoker		1.81	1.01 – 3.24		2.16	1.46 - 3.19
Both Smoker		2.94	2.20 - 3.91		4.17	3.46 - 5.02

* Reference Group; * Reference Category-Never Smoked; CI Confidence Interval
 Odds ratios are adjusted for socio-demographic variables and survey differences

The current smokers were asked about their age when they had started smoking. The geometric mean (SD) reported age of commencing smoking was 17.85 (5.01) years. The earliest reported age was 6 years and the latest 60 years. Fifty-five percent of the smokers had started smoking at their adolescence. The current age of the respondents associated with age at start of smoking; the mean reported age at the start of smoking in the <20 age group was about 1½ to 2½ years earlier than the other age groups. The influence of age was removed in analysing the influence of other socio-demographic variables on age at initiation of smoking. No significant difference was observed in mean age at starting smoking between male and female smokers and between the smokers of different religions (Table 4). Rural smokers reported starting smoking at a significantly earlier age (17.63 years) than the urban smokers (18.10 years).

Table 5: Age at Start of Smoking (years) in Relation to the Parental Smoking Status

Parental Smoking	Mean†	SD	F	p-value	Adjusted for Socio-demographic Variables		
					B	F-change	p-value
<i>Overall Influence</i>							
None Smoker*	18.41	5.77	19.3	<0.001	-.011	15.9	<0.001
Only Father Smoker	17.94	4.58					
Only Mother Smoker	17.60	5.41					
Both Smoker	17.17	5.36					
<i>Influence on Son</i>							
None Smoker*	18.32	5.43	15.7	<0.001	-.010	11.3	<0.001
Only Father Smoker	17.91	4.34					
Only Mother Smoker	17.11	4.02					
Both Smoker	17.21	5.20					
<i>Influence on Daughter</i>							
None Smoker*	19.78	9.36	5.8	0.001	-.020	5.6	0.001
Only Father Smoker	19.19	9.77					
Only Mother Smoker	20.70	9.51					
Both Smoker	16.92	6.29					

*Reference Group; †Geometric Mean

The association of parental smoking with the age of smoking initiation was assessed by one-way ANOVA. The respondents having both smoker parents started smoking at the earliest age (17.17 years). A *post hoc* test found significant differences in mean age at starting smoking between the offspring of smoker parents, non-smoker parents and smoker fathers. Sons and daughters both started smoking at an earlier age (17.21 and 16.92 years, respectively) if both the parents smoked compared with one parent smoking. Mothers' smoking did not associate with start of smoking of either male or female offspring (Table 5). A multiple regression model showed that the effect of parental smoking status on age at start of smoking was still significant after removing the effects of the socio-demographic variables and survey differences.

4. Discussion

The present study involving 35,446 adults covering both urban and rural areas was undertaken to see the impact of parental smoking behaviour on offspring smoking. Many western studies have shown that there is an association between smoking in adolescence of western cultures and parental smoking habit. No such association was tested in Bangladeshi population. The current study conducted among adults found that in both sexes current and ever smokers were more likely if both parents smoked; non-smoker parents were more likely to have non-smoker offspring. Smoking was also higher if one parent smoked; it was especially common for fathers and sons, and mothers and daughters to smoke. Although about 98-99% of the parents did not agree to allow their offspring to smoke (Rahman et al., 2006), through their smoking habit they were usually encouraging their offspring to smoke.

The process leading to regular smoking generally progresses through several well-defined stages over two to three years irrespective of age at initiation of smoking. First, the preparatory stage, attitudes and beliefs about utility of smoking are formed. Then in stage 2 individuals try their first few cigarettes. Individuals smoke repeatedly but irregularly in the third stage, and smoke at least weekly across a variety of situations in the fourth, regular stage. The final stage is the addiction/dependent stage, which is characterised by a physiological demand for nicotine (O'Loughlin et al., 1998). The role of parental smoking is not restricted to smoking onset and is present throughout different phases of the acquisition process. Results support the delayed modelling hypothesis that parental smoking affects the likelihood of children to smoke even when parents quit many years before (Otten et al., 2007). Therefore, the current study labelled parental smoking as regular smoking either currently or in the past.

Further, the offspring of both smoker parents started smoking at an earlier age compared with if only one parent smoked. The age at which individuals start smoking has fallen throughout the World (Kuper et al., 2002) and the onset of smoking among children and adolescents is a major public health concern (Buller et al., 2003). Most people try their first cigarette, and become daily smokers, as adolescents (Giovino, 2002) while those who do not smoke as adolescents or in young adulthood, are unlikely to become smokers (Esson & Leeder, 2004). The influence of parents' smoking on smoking initiation is stable and enduring whereas it increases substantially for smoking escalation occurring over the course of adolescence (Bricker et al., 2007). In this sample the reported age at which smoking commenced varied between as early as 6 years to as late as 60 years, with an average of just under 18 years. Rahman et al. (2006a) found a later starting age (20.88 years) but this is probably because they did not include 18-25 years olds in their study (Rahman et al., 2006). Sixty percent of the current smokers in this study started smoking when they were in their teens, which is in agreement with the Global Youth Tobacco Survey (Esson & Leeder, 2004).

Kuper *et al.* found that those who start smoking earlier are more likely to become heavy smokers and less likely to quit (Kuper et al., 2002), and the results of this study are in accord showing that heavy smokers, on average, started earlier (16.74 years) than moderate (17.64 years) or light smokers (18.46 years). Early smoking, before 15 years of age, doubles the risk of developing lung cancer, compared with those who start after 20 years (Kuper et al., 2002); in the current sample 29.2% started smoking by the age of 15 years and 19.2% after 20 years of age, so probably, increasing the risk of developing cancer later in life. The parental smoking not only harmful for the parents only, it might have influence on the development of smoking habit among their offspring. The parental smoking might pose extra hazard through early initiation of smoking which again can influence regular smoking and heavy smoking. Because the influence of parental smoking was pronounced among the youngest initiators, family smoking dynamics must be addressed to develop effective prevention programs tailored to this at-risk age group (Wilkinson et al., 2007).

5. Conclusion

Parental smoking influences smoking habit and the offspring of both smoker parents started smoking at an earlier age. Therefore, prevention programs should give special attention to the individuals having smoking parents.

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Competing Interests

No competing interests exist.

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