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Declining trend of tobacco use in a rural community of Bangladesh: Results of eight years of community interventions

M Mostafa Zaman, Ananna Zaman, Palash Chandra Banik, Sharker Md Numan, Md Sadekul Islam, Jasimuddin Ahmed, Sohel Reza Choudhury, Tanvir Turin Chowdhury

Department of Epidemiology, Ekhlaspur Centre of Health (ECOH), Matlab North, Chandpur 3641, Bangladesh

Abstract

Tobacco use in Bangladesh has been high, but there is no report on community-level intervention to reduce tobacco use. The aim of this article is to report the experience of eight years of community intervention to reduce tobacco use in a rural area of Bangladesh. We have done four household-based surveys (2006, 2008, 2012, and 2014) in Ekhlaspur village of Chandpur district. One man and one woman aged ≥18 years from each of 600 households were selected for each survey randomly to monitor tobacco use in this village concomitant with community interventions. The intervention package included yard meetings, health facility-based counselling, observance of the world no-tobacco days, and periodic lectures in schools. Chi-square for linear trend analysis was done to examine declining trends of prevalence of tobacco use. There were 953 to 1015 participants, approximately half being men in each survey. Their mean age was 44 to 45 years in all surveys. A decline in tobacco use has been observed from 58.8 in 2006 to 43.4% in 2014 (P_{trend}=0.000). There has not been any perceivable change in smoking in women because it was either zero or close to zero across surveys. A similar trend was observed in age groups, educational achievements, and hypertension (P_{trend}=0.000). Smoking in men declined from 58.3 to 35.2% (P_{trend}= 0.000). Community interventions in a sustainable manner can reduce tobacco use in rural communities of Bangladesh.

Keywords: Tobacco use, smoking, smokeless tobacco, community intervention, rural population, Bangladesh

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Correspondence to:
Prof. M Mostafa Zaman
Email: mmostafazaman@gmail.com

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Introduction

Tobacco is an important global public health problem[1]. A few countries have already been successful in reducing tobacco use through interventions, including community interventions[2,3,4]. Such reports are mostly from developed countries. Data from low-income countries are almost lacking.

Tobacco use is very high (35%) in Bangladesh[5], which is higher in rural areas compared to urban areas. There are ongoing efforts at national and regional levels mostly addressing the implementation of the Tobacco Control Act that has been enacted in 2005[6] and amended in 2013[1]. There has been a long paucity of data on the trend of tobacco use in Bangladesh, even after having these legislative tools at hand. A review article indicated that smokeless tobacco has been replacing smoking tobacco in

Bangladesh[2]. However, no study has reported the usefulness of community interventions in tobacco control.

It is important that tobacco use in Bangladesh, especially in rural areas[5] is monitored periodically. There is no published best practice example at the community level from any corner of Bangladesh. The aim of this study was to examine whether a simple but persistent intervention can reduce tobacco use in a rural area of Bangladesh.

Methods

The intervention was done in Ekhlaspur village, some 60 km south-east of the capital city of Dhaka. It had 802 households in 2006 which increased to 1036 in 2014. People of this agricultural area have a traditional lifestyle, but the recent introduction of electricity exposed them to television and mobile phones[1]. The ECOH (Ekhlaspur Center of Health) management obtained community consent, and engaged opinion leaders, and schools. Given the data are part of the periodic medical examinations especially linked to the awareness creation on the eve of World No Tobacco Day, no ethical clearance was sought. We obtained the verbal consent of all participants for all surveys.

The community intervention

The ECOH, a non-governmental voluntary organization established by one of us (MMZ), has been providing health promotional services through its campaigns, domiciliary visits, and services at its outpatient clinic. It is located in Ekhlaspur village of Matlab North Upazila in Chandpur district. Trained health workers have been creating awareness about the harms of tobacco among people. Community-based cessation programme, such as holding yard counselling meetings in a programmatic manner was organized. World No Tobacco Days have been observed each year.

All formal leaders of the community had been engaged. They included union council members, market and mosque committee members, village doctors, and health workers of the government and non-government sectors. Flyers, posters, and stickers were used for wide distribution and display.

Schools and '*madrashas*' (Islamic religious schools) were engaged through their management committees and teachers, who were oriented at periodic intervals. Teachers and ECOH staff delivered talks to the students to carry home messages. Flip charts were used in the classrooms and calendars with anti-tobacco messages were printed and distributed. Tobacco-free sign ages were displayed in all public places. Smoke-free homes were implemented using school students[1]. Essay competitions on tobacco were organized for classes 7 to 10 every year, followed by prize distribution ceremonies to create public opinion against tobacco.

Health facility-based counselling was routinely done to all who visited ECOH for services in outpatients, cardiovascular disease clinic, and antenatal check-ups. Records of all such visits were kept electronically. A billboard hosted anti-tobacco messages by rotation in collaboration with national and international NGOs.

Cross-sectional surveys

Cross-sectional health surveys were done using similar approaches to engaging the community. Household-based list of all people of the village is available since 1999 that is being updated every year. For these surveys, we selected two adults aged ≥18 years per household, a total of 600 households. Thus, a total of 1200 were invited with a target of 1000 participants each year.

Data on age, sex, educational achievement, and tobacco use were collected using a questionnaire administered by the trained and experienced health assistants of ECOH. Information on tobacco was segregated into smoking (cigarette, *Biri, Hukkah*, etc.) and smokeless tobacco products (*Zarda, Sadapata, Gul, pan masala* with tobacco leaf, etc.)[5]. In addition, we collected data on the history of the treatment of hypertension and measured blood pressure. We defined hypertension as blood pressure ≥140/90 mmHg or medication for reducing blood pressure.

Statistical analysis

We calculated the proportion of tobacco users (smoking and smokeless) for four survey years. We performed Chi-square for linear trend analysis of age (<40 and ≥40 years), sexes, education (≤Primary (grades 1 to 5) and >Primary), and hypertension (yes and no) to examine the trend of tobacco use across four survey years during an eight-year duration (2006 – 2014). We prepared a time-series graph to examine the trend of smoking in men. All statistical tests were two-sided, and we considered $P<0.05$ to be statistically significant.

Results

The number of participants were 953 in 2006 and 963 in 2014 surveys. Response rates were identical in all the surveys, about 80%. Total and sex-specific results are given in **Table 1**. Participants' mean ages were between 44 and 45 years in four surveys.

Overall, 58.8% of the survey participants were using tobacco in any form in 2006. Thereafter a gradual decline in tobacco use has been observed, ending at 37.6% in 2014 ($P_{trend}=0.000$). This gives rise to a 36.1% decline[(58.8-37.6)/58.8)100], compared to the baseline, over a period of eight years. The use of smokeless tobacco was almost the same in men and women. On the contrary, the smoking rates in women were either

TABLE 1 Tobacco (smoking and smokeless) use (%) among adults (18 years) in Ekhlaspur village of Chandpur district, Bangladesh, 2006-2014

Background and tobacco use	2006	2008	2012	2014	x^2 for linear trend	*P*
Background:						
No. participated/targeted	953/1200	957/1200	1015/1200	963/1200		
Response rates (%)	79.4	79.8	84.6	80.3		
No. men/women participated	482/471	451/506	431/584	420/543		
Age in years, mean (standard deviation)						
Men and women	44.8 (13.2)	42.4 (15.8)	45.4 (15.8)	43.9 (17.8)		
Men	44.8 (13.4)	42.6 (16.9)	47.4 (16.8)	45.3 (17.7)		
Women	44.9 (13.1)	42.2 (14.9)	43.8 (14.9)	42.8 (17.8)		
Tobacco use						
Sex						
Men and women	58.8	50.6	41.3	37.6	103.17	0.000
Men	71.6	63.2	55.7	46.4	62.24	0.000
Women	45.7	39.3	30.7	30.8	32.55	0.000
Age¶						
<40 year	42.0	33.6	19.7	15.1	88.89	0.000
≥40 years	68.4	64.8	53.9	55.4	33.90	0.000
Education						
Primary or less	60.3		48.0	51.1	20.30	0.000
Above primary	52.7		23.8	21.6	36.81	0.000
Hypertension†						
No	55.4	47.4	41.6	36.4	53.76	0.000
Yes	52.1	67.3	39.8	46.0	10.69	0.001

¶Age categories are according to the NCD Monitoring Framework of the World Health Organization
†Blood pressure 140/90, or medication for hypertension

zero or close to zero percent. Therefore, a separate analysis of smoking for women was not done. Therefore, we examined the smoking rates in men separately (**Figure I**).

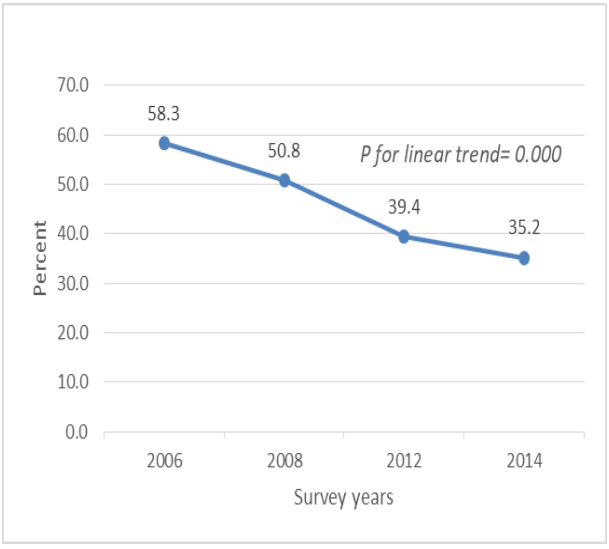


FIGURE I Trend of smoking in men (%) of Ekhlaspur village of Chandpur district, Bangladesh, 2006 — 2014

The decline, compared to the baseline, was 39.6% (P_{trend}=0.000). Stratified analysis for age, education, and hypertension showed a similar and significant (P_{trend}=0.000) decline in tobacco use (**Table 1**).

Discussion

We report here more than one-third decline in tobacco use in less than a decade in a rural community for the first time in Bangladesh due to simple but persistent community interventions. However, we do not have any control area to exclude that the decline is part of a nationwide decline in general. There is an indication that a one percent decline per year has happened in Bangladesh[5]. Considering this true for Ekhlaspur community, we could expect an 8%decline, which is one-fifth of the decline we observed. It is to be noted that the intervention in this village has not been done for research. Rather it is part of a community initiative to establisha health-promoting village. We acknowledge that the use of ECOH staff for both intervention and data collection is a weakness of our findings.

We acknowledge that tobacco control measures are ongoing at national and regional levels. These include sporadic media campaigns and legislative measures for smoke-free public places and transport. Media campaign has a mild to moderate penetration in the

rural area of Bangladesh. However, in this remote village, the penetration is very little. Text-based package warnings of tobacco products have been started in 2006[6]. A low level of education is a big hindrance to comprehending text-based pack warnings. Our last survey of this series was done in 2014 before the introduction of graphical health warnings on tobacco products came into effect in 2018[7]. A smoke-free public transport defined by the Act does not have relevance to a village like ours. A strong tax measure could significantly impact rural communities. Compared to inflation in the market, there is hardly any increase in the real price of tobacco products. Therefore, tobacco products remained highly affordable in Bangladesh[1], even for rural communities like ours.

There is no convincing evidence from around the country that such as huge decline has happened in Bangladesh. Recently conducted Global Adult Tobacco Survey (2017)[5] has reported a decline of 18% from the 2009 baseline. However, the STEPS survey conducted in 2018 has refuted such a big decline[1]. In case of a genuine decline at national level, there should have been substantial decline in agricultural and industrial production of tobacco, but these are increasing[2]

Let us review why this decline has been made possible in Ekhlaspur. ECOH started various awareness programmes on tobacco in 2004. Its intervention has addressed all aspects of tobacco control that can be done at village level as mentioned in the Methods section. The intervention package did not include anything on cultivation because there is no tobacco cultivation in the area. Similarly, local communities have nothing to do with taxation and package warning. These are national-level issues. Smoke-free public transports are not applicable in this village. However, smoke-free public places (at schools, union council, post office, ECOH and other health settings in Ekhlaspur) were enforced by the community. Smoke-free homes engaging the school children was another big contributor. Nobody smokes inside the mosques where large gatherings happen every day, especially on Friday. Tobacco-free sign ages have been displayed visibly in all public places except the mosques, but the mosque was used propagate anti-tobacco messages in line with Islamic rules.

Tobacco ad bans, legally saying, cannot be enforced by the community. However, the point-of-sale advertisement could be stopped because of ECOH volunteers' vigilance and cooperation of the shopkeepers. Advocacy meetings with shopkeepers were held for their cooperation on issues including sales to minors. Sale by minors has not been a problem in the locality. Opportunities of world hypertension day and world heart day observance were also used to create awareness on tobacco harms. A smoking room was also established in the local market. Smokers had to go to this room for smoking. This has created a huge impact to create a smoke-free norm here. Anti-tobacco music shows and stage dramas were organized by Ekhlaspur High School in collaboration with ECOH. One of such music shows has been televised by a popular TV channel (Channel-I) with a nationwide coverage. This TV episode was done as the best practice in Chandpur district. To summarize, every opportunity has been used to de-popularize, de-glamorize and de-normalize tobacco products.

The combined effect of all these anti-tobacco activities for about a decade in this area has resulted in a substantial reduction (more than one-third) of tobacco use. These results suggest that a sustainable concerted effort to reduce tobacco consumption should sustain over years to have a substantial impact. Similar findings have been reported elsewhere in the world, such as India[14], Nepal[15], and China[16]. Their main measures included legislative and awareness in India, regulatory measures in Nepal, and the Healthy China 2030 Initiative in China.

Finally, we would reiterate that our model includes a cascade of activities such as engagement of The combined effect of all these anti-community leaders (formal and informal), community awareness creation using various educational materials, campaigns at schools, yard meetings, and patient counselling in the outpatient department, cardiovascular disease clinic, and antenatal check-up clinic of ECOH. Now the question is how this intervention fits into the health system of Bangladesh. ECOH's catchment area is a village, equivalent to four wards (the lowest administrative unit) like other rural areas of Bangladesh. ECOH has both fixed facility and domiciliary services. Community clinics established all over Bangladesh at the ward level have a similar attribute to ECOH. Currently, about 13,000 community clinics are functional[17] having both fixed facilities and work in collaboration with the domiciliary services provided by the health assistants and family planning assistants. Therefore, the best practice that we report here has a high potential for replication in rural areas of Bangladesh through community clinics. This is expected to bring a promising result by reducing tobacco use in Bangladesh in near future.

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Author Contribution

MMZ conceptualized the intervention, guided data analysis, interpreted results, wrote the manuscript. TTC designed the intervention, developed the data collection tools, and revised the manuscript critically. AZ, JA and PCB established methodologies, executed the campaign, trained the health assistants, and monitored data collection, guided counselling, analysed data, and reviewed the literature. All authors have approved the submission.

Conflict of Interest

We do not have any conflict of interest.

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ORCID iDs:

M Mostafa Zaman https://orcid.org/0000-0002-1736-1342
Ananna Zaman, https://orcid.org/0000-0002-3736-5113;
Palash Chandra Banik, https://orcid.org/0000-0003-2395-9049;
Sharker Md Numan https://orcid.org/0000-0002-1875-1561;
Sohel Reza Choudhury https://orcid.org/0000-0002-7498-4634
Tanvir Turin Choudhuryhttps://orcid.org/0000-0002-7499-5050

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