A Cross-Country Comparison of Knowledge, Attitudes and Practices about Tobacco Use: Findings from the Global Adult Tobacco Survey

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Abstract

Background: Knowledge and individual perceptions about adverse effects of all forms of tobacco exert direct influence on the level of tobacco consumption in various socio-demographic groups. The objective of this study was to determine the nature, extent and demographic correlates of knowledge, attitudes and perceptions of use of tobacco among adults in low and middle income countries. Materials and Methods: The Global Adult Tobacco Survey, conducted in fourteen different countries from 2008-2010, was sourced for the data analyzed in this study. Descriptive statistical analyses were conducted to determine the prevalent knowledge and individual perceptions amongst adults about all forms of tobacco consumption. Results: There was relatively high awareness about the harmful effects of smoking tobacco with main awareness being about its relationship with lung cancer (>90% in most countries). In contrast, there was relatively low awareness about harmful effects of smokeless tobacco (<90% in all countries except India and Bangladesh), and observed correlation of smoking tobacco with heart attack (40.6% in China, 65.1% in India) and stroke (28.2% in China, 50.5% in India). Conclusions: A large proportion of adults living in low and middle income countries possess adequate knowledge about smoking tobacco but have inadequate awareness as well as false perceptions about smokeless forms of tobacco. Popular beliefs of inverse relationships of tobacco consumption with knowledge, attitudes and perception of populations towards tobacco are challenged by the findings of this study.

Keywords: Tobacco - knowledge attitude and practice - Global Adult Tobacco Survey

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Introduction

Tobacco use remains responsible for being one of the largest contributors to premature death, causing millions of deaths worldwide every year (World Health Organization, 2002; Thun et al., 2010). Both smoked and smokeless, forms of tobacco are associated with increased risk of chronic and terminal diseases (Critchley et al., 2003; Gupta et al., 2003; Nair et al., 2004; Krishna et al., 2013). These diseases include destructive periodontitis (Cutress, 2003; Gupta et al., 2003; Gupta et al., 2013); oral and oropharyngeal cancers (Johnson et al., 2011; Radoi et al., 2013); oral potentially malignant disorders, notably leukoplakia, erythroplakia, and oral submucous fibrosis (Warnakulasuriya et al., 2007) and cardiovascular disorders including stroke (Gupta et al., 2013). Other significant health disorders associated with tobacco consumption include erectile dysfunction (Wang et al., 2013) and problems in pregnancy, including stillbirth and low birth weight babies (Wisborg et al., 2001; England et al., 2010).

Knowledge and individual perceptions about adverse effects of all forms of tobacco, in addition to its social acceptance may influence the level of tobacco consumption in various socio-demographic groups (van Zyl et al., 2013). Though there is significant awareness at population level about lung cancer being related to smoking and smokeless tobacco in most of the world, however, no comparisons have been drawn among different nations about the knowledge of general population about relationship of smoking and smokeless tobacco consumption to other life threatening illnesses, like heart attack and stroke. In addition, as compared to smoking, little is known about the level of awareness of general population about health impact of second hand smoke.

Further, few studies have measured the knowledge, attitudes and perceptions of adult population (above 15 years) about impact of smoking, smokeless tobacco as well as second hand smoke on health, with particular reference to lung cancer, stroke and heart attack at a national level and no studies are available which have drawn any inter-
Beliefs about the health effects of smoking

Beliefs about health effects of smoking were assessed among all consenting responders by asking the question- “Does smoking tobacco cause serious illness?”

Beliefs about the health effects of second hand smoke

Beliefs about health effects of second hand smoke were assessed among all consenting responders by asking the question- “Does breathing other people’s smoke cause serious illness in non-smokers?”

Data Analysis

For every nation, knowledge, attitudes and perceptions about smoking, smokeless tobacco and second hand smoke were assessed overall by age, gender and residence. 95% confidence intervals were calculated on weighted data using SPSS V.18 which enabled estimation of variation in the clustered sample design. Estimates were not presented when the sample size for any subpopulation was less than 25 cases.

Results

Age distribution of adults who believe that smoking tobacco causes serious illness

Out of all the respondents in 15–24 year group, percentage of individuals who believed smoking tobacco causes serious illness was 98% in Bangladesh, 97% in Brazil, 89.4% in China, 97.5% in Egypt, 92.4% in India, 98.9% in Mexico, 95.0% in the Philippines, 93.5% in Poland, 89.1% in Russian Federation, 99.3% in Thailand, 97.8% in Turkey, 94.6% in Ukraine, 99.0% in Uruguay, 97.2% in Vietnam.

Out of the respondents in 25-44 year group, percentage of individuals who believed smoking tobacco causes serious illness was 98.2% in Bangladesh, 97% in Brazil, 84.7% in China, 97.9% in Egypt, 91.1% in India, 98.8% in Mexico, 94.2% in the Philippines, 92.0% in Poland, 90.4% in Russian Federation, 99.1% in Thailand, 97.9% in Turkey, 93.7% in Ukraine, 98.7% in Uruguay, 96.1% in Vietnam.

Out of the respondents in 45–64 year group, percentage of individuals who believed smoking tobacco causes serious illness was 96.3% in Bangladesh, 95.6% in Brazil, 77.8% in China, 97.4% in Egypt, 88.1% in India, 97.4% in Mexico, 93.8% in the Philippines, 89.6% in Poland, 90.8% in Russian Federation, 98.5% in Thailand, 97.2% in Turkey, 92.4% in Ukraine, 96.1% in Uruguay and 95.6% in Vietnam.

Out of the respondents in 65+ year group, percentage of individuals who believed smoking tobacco causes serious illness was 92.7% in Bangladesh, 92.1% in Brazil, 65.6% in China, 94.2% in Egypt, 82.0% in India, 94.5% in Mexico, 89.1% in the Philippines, 92.3% in Poland, 93.6% in Russian Federation, 95.0% in Thailand, 92.8% in Turkey, 91.9% in Ukraine, 96.1% in Uruguay, 90.1% in Vietnam (Table 1).

Gender distribution of adults who believe that smoking tobacco causes serious illness
The percentage of males amongst the respondents who believe that smoking tobacco causes serious illness was 97.6% in Bangladesh, 95.9% in Brazil, 83.3% in China, 97.3% in Egypt, 91.5% in India, 98.2% in Mexico, 93.1% in the Philippines, 90.4% in Poland, 88.0% in Russian Federation, 98.2% in Thailand, 97.8% in Turkey, 91.5% in Ukraine, 97.4% in Uruguay, 95.5% in Vietnam.

The percentage of females amongst the respondents who believe that smoking tobacco causes serious illness was 97.2% in Bangladesh, 96.3% in Brazil, 80.3% in China, 97.9% in Egypt, 88.8% in India, 98.1% in Mexico, 94.9% in the Philippines, 92.6% in Poland, 93.2% in Russian Federation, 98.9% in Thailand, 96.7% in Turkey, 94.6% in Ukraine, 97.8% in Uruguay, 96.0% in Vietnam (Table 2).

Residential (urban/rural) distribution of adults who believe that smoking tobacco causes serious illness

The percentage of urban based adults amongst the respondents who believe that smoking causes serious illness was 97.5% in Bangladesh, 96.4% in Brazil, 96.1% in China, 98.4% in Egypt, 93.8% in India, 98.6% in Mexico, 98.1% in the Philippines, 90.8% in Poland, 90.2% in Russian Federation, 93.2% in Thailand, 97.7% in Turkey, 93.4% in Ukraine, 97.6% in Uruguay, 97.6% in Vietnam.

The percentage of rural based adults amongst the respondents who believe that smoking causes serious illness was 97.3% in Bangladesh, 94.2% in Brazil, 96.4% in China, 96.9% in Egypt, 88.7% in India, 96.5% in Mexico, 98.6% in Philippines, 90.2% in Poland, 92.8% in Russian federation, 93.4% in Thailand, 96% in Turkey, 92.6% in Ukraine, 96.9% in Uruguay, 97.6% in Vietnam.

Distribution of level of awareness about types of serious illnesses caused by smoking tobacco (Figure 1)

The percentage of adults amongst the respondents who believe that smoking causes lung cancer was 94.2% in Bangladesh, 96.0% in Brazil, 79.0% in China, 96.0% in Egypt, 87.2% in India, 96.6% in Mexico, 91.5% in Philippines, 91.8% in Poland, 88.5% in Russian federation, 97.4% in Thailand, 96.8% in Turkey, 89.7% in Ukraine, 96.9% in Uruguay, 95.2% in Vietnam.

The percentage of adults amongst the respondents who believe that smoking causes heart attack was 90.2% in Bangladesh, 87.1% in Brazil, 40.6% in China, 94.8% in Russia, 90.2% in Thailand, 96.6% in Turkey, 90.2% in Ukraine, 97.4% in Uruguay, 97.6% in Vietnam.
in Egypt, 65.1% in India, 80.5% in Mexico, 77.6% in Philippines, 79.5% in Poland, 65.7% in Russian federation, 75.3% in Thailand, 94.4% in Turkey, 75.5% in Ukraine, 92.3% in Uruguay, 63.0% in Vietnam.

The percentage of adults amongst the respondents who believe that smoking causes heart attack was 87.2% in Bangladesh, 75.5% in Brazil, 28.2% in China, 88.6% in Egypt, 50.5% in India, 59.9% in Mexico, 71.4% in Philippines, 59.3% in Poland, 60.9% in Russian federation, 79.8% in Thailand, 83.7% in Turkey, 73.9% in Ukraine, 75.9% in Uruguay, 69.3% in Vietnam.

Figure 1. Percent of Adult who Believe that smoking causes Lung Cancer, Heart Attack, or Stroke. Percentage (%): A weight Percentage Reflecting the Population does not cause Lung Cancer, Heart Attack, or Stroke.

| Country     | Year | 15-24 | 25-44 | 45-64 | 65+ | Total |
|-------------|------|-------|-------|-------|-----|-------|
| Bangladesh  | 2009 | 92.9  | 93.6  | 92.5  | 87.1| 92.7  |
| Brazil      | 2008 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| China       | 2010 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Egypt       | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| India       | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Mexico      | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Philippines | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Poland      | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Russia      | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Thailand    | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Turkey      | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Ukraine     | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Uruguay     | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |
| Vietnam     | 2009 | 69.6  | 69.6  | 67.1  | 64.0| 68.2  |

Table 3. Percentage of Adults by Age who Believe that using Smokeless Tobacco Causes Serious Illness

| Country     | Year | Male | Female | Total |
|-------------|------|------|--------|-------|
| Bangladesh  | 2009 | 92.6 | 92.9  | 92.7  |
| Brazil      | 2008 | 69.6 | 69.6  | 69.6  |
| China       | 2010 | 69.6 | 69.6  | 69.6  |
| Egypt       | 2009 | 69.6 | 69.6  | 69.6  |
| India       | 2009 | 69.6 | 69.6  | 69.6  |
| Mexico      | 2009 | 69.6 | 69.6  | 69.6  |
| Philippines | 2009 | 69.6 | 69.6  | 69.6  |
| Poland      | 2009 | 69.6 | 69.6  | 69.6  |
| Russia      | 2009 | 69.6 | 69.6  | 69.6  |
| Thailand    | 2009 | 69.6 | 69.6  | 69.6  |
| Turkey      | 2009 | 69.6 | 69.6  | 69.6  |
| Ukraine     | 2009 | 69.6 | 69.6  | 69.6  |
| Uruguay     | 2009 | 69.6 | 69.6  | 69.6  |
| Vietnam     | 2009 | 69.6 | 69.6  | 69.6  |

Table 4. Percentage of Adults by Gender and Residence who Believe that using Smokeless Tobacco Causes Serious Illness

| Country     | Year | Male | Female | Total |
|-------------|------|------|--------|-------|
| Bangladesh  | 2009 | 92.6 | 92.9  | 92.7  |
| Brazil      | 2008 | 69.6 | 69.6  | 69.6  |
| China       | 2010 | 69.6 | 69.6  | 69.6  |
| Egypt       | 2009 | 69.6 | 69.6  | 69.6  |
| India       | 2009 | 69.6 | 69.6  | 69.6  |
| Mexico      | 2009 | 69.6 | 69.6  | 69.6  |
| Philippines | 2009 | 69.6 | 69.6  | 69.6  |
| Poland      | 2009 | 69.6 | 69.6  | 69.6  |
| Russia      | 2009 | 69.6 | 69.6  | 69.6  |
| Thailand    | 2009 | 69.6 | 69.6  | 69.6  |
| Turkey      | 2009 | 69.6 | 69.6  | 69.6  |
| Ukraine     | 2009 | 69.6 | 69.6  | 69.6  |
| Uruguay     | 2009 | 69.6 | 69.6  | 69.6  |
| Vietnam     | 2009 | 69.6 | 69.6  | 69.6  |
causes serious illness was 92.5% in Bangladesh, 67.1% in Brazil, not recorded% in China, not recorded% in Egypt, 86.1% in India, 67.1% in Mexico, 48.9% in Philippines, 36.1% in Poland, 45.3% in Russian Federation, 73.4% in Thailand, not recorded% in Turkey, 42.4% in Ukraine, 53.2% in Uruguay, 57.9% in Vietnam.

Out of the respondents in 65+ year group, percentage of individuals who believed that using smokeless tobacco causes serious illness was 87.1% in Bangladesh, 64.0% in Brazil, not recorded% in China, not recorded% in Egypt, 79.8% in India, 60.6% in Mexico, 42.5% in the Philippines, 43.0% in Poland, 49.0% in Russian Federation, 64.0% in Thailand, not recorded% in Turkey, 35.1% in Ukraine, 59.3% in Uruguay, 49.2% in Vietnam (Table 3).

Gender distribution of adults who believe that using smokeless tobacco causes serious illness

The percentage of urban based adults amongst the respondents who believed that using smokeless tobacco causes serious illness was 92.6% in Bangladesh, 66.9% in Brazil, not recorded% in China, not recorded% in Egypt, 90.1% in India, 64.5% in Mexico, 46.2% in the Philippines, 33.6% in Poland, 37.9% in Russian Federation, 69.2% in Thailand, not recorded% in Turkey, 38.9% in Ukraine, 50.9% in Uruguay, 53.8% in Vietnam (Table 4).

The percentage of females amongst the respondents who believe that using smokeless tobacco causes serious illness was 92.9% in Bangladesh, 69.5% in Brazil, not recorded% in China, not recorded% in Egypt, 87.3% in India, 70.3% in Mexico, 50.2% in the Philippines, 44.0% in Poland, 47.3% in Russian Federation, 72.9% in Thailand, not recorded% in Turkey, 42.9% in Ukraine, 55.6% in Uruguay, 57.1% in Vietnam (Table 4).

Residential distribution of adults who believe that using smokeless tobacco causes serious illness

The percentage of urban based adults amongst the respondents who believe that using smokeless tobacco causes serious illness was 94.9% in Bangladesh, 68.1% in Brazil, not recorded% in China, not recorded% in Egypt, 93.0% in India, 68.1% in Mexico, 49.6% in the Philippines, 37.2% in Poland, 41.4% in Russian Federation, 69.6% in Thailand, not recorded% in Turkey, 42.0% in Ukraine, 52.9% in Uruguay, 56.8% in Vietnam.

The percentage of rural based adults amongst the respondents who believe that using smokeless tobacco causes serious illness was 92.0% in Bangladesh, 69.2% in Brazil, not recorded% in China, not recorded% in Egypt, 87.0% in India, 65.6% in Mexico, 46.8% in The Philippines, 42.1% in Poland, 47.8% in Russian Federation, 71.8% in Thailand, not recorded% in Turkey, 39.1% in Ukraine, 60.0% in Uruguay, 54.9% in Vietnam.

Age distribution of adults who believe that breathing other people’s smoke causes serious illness to non-smokers

Out of the respondents in 15-24 year group, percentage of individuals who believed that breathing other people’s smoke causes serious illness was 95.2% in Bangladesh, 92.6% in Brazil, 77.5% in China, 96.8% in Egypt, 86.6% in India, 96.8% in Mexico, 92.7% in The Philippines, 80.5% in Poland, 77.4% in Russian Federation, 97.5% in Thailand, 95.9% in Turkey, 87.7% in Ukraine, 94.3% in Uruguay, 92.5% in Vietnam.

Out of the respondents in 25-44 year group, percentage of individuals who believed that breathing other people’s smoke causes serious illness was 94.9% in Bangladesh, 92.9% in Brazil, 68.4% in China, 96.9% in Egypt, 83.5% in India, 96.1% in Mexico, 92.9% in the Philippines, 81.9% in Poland, 80.8% in Russian Federation, 97.0% in Thailand, 95.8% in Turkey, 87.1% in Ukraine, 96.5% in Uruguay, 88.2% in Vietnam.

Out of the respondents in 45-64 year group, percentage of individuals who believed that breathing other people’s smoke causes serious illness was 91.6% in Bangladesh, 90.8% in Brazil, 56.6% in China, 96.3% in Egypt, 79.8% in India, 95.0% in Mexico, 90.1% in The Philippines, 80.8% in Poland, 83.4% in Russian Federation, 94.4% in Thailand, 96.3% in Turkey, 86.1% in Ukraine, 91.2% in Uruguay, 84.4% in Vietnam.

Out of the respondents in 65+ year group, percentage of individuals who believed breathing other people’s smoke causes serious illness was 81.5% in Bangladesh, 84.6% in Brazil, 41.9% in China, 89.4% in Egypt, 72.9% in India,
Gender distribution of adults who believe that breathing other people’s smoke causes serious illness to non-smokers

The percentage of males amongst the respondents who believed that breathing other people’s smoke causes serious illness was 97.0% in Bangladesh, 90.8% in Brazil, 65.3% in China, 96.8% in Egypt, 84.9% in India, 95.2% in Mexico, 90.2% in the Philippines, 77.4% in Poland, 75.7% in Russian Federation, 94.6% in Thailand, 95.9% in Turkey, 82.5% in Ukraine, 93.2% in Uruguay, 87.0% in Vietnam.

The percentage of females amongst the respondents who believed that breathing other people’s smoke causes serious illness was 99.9% in Bangladesh, 91.9% in Brazil, 63.2% in China, 95.8% in Egypt, 80.8% in India, 96.1% in Mexico, 93.0% in the Philippines, 85.1% in Poland, 80.7% in Russian Federation, 95.2% in Thailand, 95.1% in Turkey, 89.5% in Ukraine, 94.3% in Uruguay, 86.9% in Vietnam.

Residential distribution of adults who believe that breathing other people’s smoke causes serious illness to non-smokers

The percentage of rural based adults amongst the respondents who believe that breathing other people’s smoke causes serious illness was 98.9% in Bangladesh, 91.9% in Brazil, 77.1% in China, 98.1% in Egypt, 88.0% in India, 96.4% in Mexico, 93.9% in the Philippines, 79.9% in Poland, 81.1% in Russian Federation, 96.1% in Thailand, 96.3% in Turkey, 87.0% in Ukraine, 93.7% in Uruguay, 91.4% in Vietnam.

The percentage of urban based adults amongst the respondents who believe that breathing other people’s smoke causes serious illness was 94.9% in Bangladesh, 92.1% in Brazil, 77.1% in China, 98.1% in Egypt, 88.0% in India, 96.4% in Mexico, 93.9% in the Philippines, 79.9% in Poland, 81.1% in Russian Federation, 96.1% in Thailand, 96.3% in Turkey, 87.0% in Ukraine, 93.7% in Uruguay, 91.4% in Vietnam.

The percentage of females amongst the respondents who believe that breathing other people’s smoke causes serious illness was 98.9% in Bangladesh, 91.9% in Brazil, 63.2% in China, 95.8% in Egypt, 80.8% in India, 96.1% in Mexico, 93.0% in the Philippines, 85.1% in Poland, 80.7% in Russian Federation, 95.2% in Thailand, 95.1% in Turkey, 89.5% in Ukraine, 94.3% in Uruguay, 86.9% in Vietnam.

Gender distribution of adults who believe that smoking tobacco being a cause of serious illness was uniformly high (>90%) across all countries where GATS was conducted except in China (81.8%). The awareness about the harmful effects was predominantly about the relationship between smoking tobacco and lung cancer (>90% in most countries). In comparison, the awareness about relationship of smoking tobacco to heart attack (40.6% in China, 65.1% in India) and stroke (28.2% in China, 50.5% in India) was relatively much lower. This trend is reflected for all the countries where GATS was conducted (see Figure 1). Also, the awareness was fairly uniform across all age groups in most of the countries, except in China where the awareness was least in elderly age group (65+) (Table 1).

Considering gender trends, there was marginally higher awareness amongst males in China and India and slightly higher awareness amongst females in Russian federation and Ukraine. There was no significant difference in awareness between both genders in other countries (Table 2). India and Mexico exhibit slightly higher awareness in urban population in comparison to uniform awareness in rural areas in all the countries where GATS was conducted except China.

Table 6. Percentage of Adults by Gender and Residence who Believe that Breathing other People’s Smoke Causes Serious Illness to Non-smokers

| Country      | Year | Male (%) | Female (%) | Total (%) | Urban (%) | Rural (%) | Total (%) |
|--------------|------|----------|------------|-----------|-----------|-----------|-----------|
| Bangladesh   | 2009 | 97.0     | 98.9       | 98.0      | 97.0      | 97.0      | 97.0      |
| Brazil       | 2008 | 90.8     | 91.9      | 91.2      | 90.8      | 90.8      | 90.8      |
| China        | 2010 | 65.3     | 63.2      | 64.1      | 65.3      | 65.3      | 65.3      |
| Egypt        | 2009 | 96.8     | 95.8      | 96.3      | 96.8      | 96.8      | 96.8      |
| India        | 2009 | 84.9     | 80.8      | 82.9      | 84.9      | 84.9      | 84.9      |
| Mexico       | 2009 | 95.2     | 95.6      | 95.4      | 95.2      | 95.2      | 95.2      |
| Philippines  | 2009 | 90.2     | 91.6      | 90.9      | 90.2      | 90.2      | 90.2      |
| Poland       | 2009 | 77.4     | 81.4      | 79.4      | 77.4      | 77.4      | 77.4      |
| Russian Federation | 2009 | 75.7 | 81.8 | 78.2 | 75.7 | 75.7 | 75.7 |
| Thailand     | 2009 | 94.0     | 94.9      | 94.5      | 94.0      | 94.0      | 94.0      |
| Turkey       | 2008 | 95.0     | 95.5      | 95.3      | 95.0      | 95.0      | 95.0      |
| Ukraine      | 2010 | 82.5     | 86.5      | 84.5      | 82.5      | 82.5      | 82.5      |
| Uruguay      | 2009 | 93.2     | 93.8      | 93.5      | 93.2      | 93.2      | 93.2      |
| Vietnam      | 2010 | 87.0     | 86.6      | 86.8      | 87.0      | 87.0      | 87.0      |

Discussion

This study assessed data from GATS conducted across 14 low- and middle income nations to assess knowledge, attitudes and perceptions towards tobacco use in a nationally representative sample of adults in these nations. To our knowledge, this is the first ever study to explore these aspects drawing international comparisons as well as using the largest ever population sample size. The results are suggestive that a large number of adults in most of the countries do believe that tobacco consumption (smoking and smokeless tobacco) in addition to exposure to second hand smoke causes serious illness. However, significant variations were observed across gender and age in most nations. The variations were not significant between urban and rural regions. But there was a significant variation between observed levels of relatively high knowledge about harmful effects of tobacco consumption which did not co-relate with high actual tobacco consumption levels.

The awareness about smoking tobacco being a cause of serious illness was uniformly high (>90%) across all countries where GATS was conducted except in China (81.8%). The awareness about the harmful effects was predominantly about the relationship between smoking tobacco and lung cancer (>90% in most countries). In comparison, the awareness about relationship of smoking tobacco to heart attack (40.6% in China, 65.1% in India) and stroke (28.2% in China, 50.5% in India) was relatively much lower. This trend is reflected for all the countries where GATS was conducted (see Figure 1). Also, the awareness was fairly uniform across all age groups in most of the countries, except in China where the awareness was least in elderly age group (65+) (Table 1). Considering gender trends, there was marginally higher awareness amongst males in China and India and slightly higher awareness amongst females in Russian federation and Ukraine. There was no significant difference in awareness between both genders in other countries (Table 2). India and Mexico exhibit slightly higher awareness in urban population in comparison to uniform awareness in rural areas in all the countries where GATS was conducted except China.
other countries irrespective of the residence of the study population (Table 2).

On the contrary, awareness about harmful effects of smokeless tobacco was significantly low in most countries with an exception of Bangladesh (92.7%) and India (88.8%). Poland, the Philippines, Ukraine and Russian federation showed significantly low awareness (<50%) about harmful effects of smokeless tobacco. Unfortunately, no data was collected for smokeless tobacco in China and Egypt. These trends are quite alarming showing the societal acceptance of smokeless tobacco as a harmless substance in these countries (Gupta et al., 2013). This awareness was the least in 65+ age group across all countries (Table 3). The awareness of female population about harmful effects of smokeless tobacco was higher in all countries except India where male awareness was slightly higher. Rural population showed higher awareness in Poland, Russian Federation, Uruguay and Bangladesh whereas urban population showed higher awareness in other countries (Table 3).

The awareness about harmful effects of second hand smoke was lowest in China (64.3%), relatively low in India (82.9%), Poland (81.4%), Russian Federation (81.9%), Ukraine (86.3%) and it was more than 90% in all other countries. Females showed higher awareness in all countries except India. Urban population showed higher awareness in Bangladesh, India, Mexico, Philippines and Ukraine (Table 4). The awareness was least in 65+ age group with younger age groups showing higher awareness in all countries (Table 5). Females showed higher awareness in Poland, the Philippines, Russian federation and Ukraine. Rural population showed higher awareness in Poland, Russian Federation and Uruguay whereas urban population showed higher awareness in other countries (Table 6).

It is popularly believed that gaining knowledge about ill effects of tobacco use is likely to influence individual consumption of tobacco by smoking or smokeless products (Shiffman, 1986; Charlton et al., 1989; Nobile et al., 2000; Ma et al., 2003; Panda et al., 2012). However, a high level of knowledge about the ill effects of tobacco consumption is not necessarily a predictor of low tobacco consumption prevalence (Flay et al., 1999; Rosendahl et al., 2005). GATS survey in multiple countries has shown that awareness about harmful effects of tobacco smoking is very high. In view of this, it is difficult to explain the high prevalence of tobacco use despite high levels of knowledge about its harmful effects (Jena et al., 2013). One needs to consider other factors as possible mediators in individuals’ decision to adopt and continue smoking habits (Rosendahl et al., 2005). Further studies are required to establish the association between knowledge of harmful effects of tobacco and smoking habits and factors influencing these decisions over time, especially during adolescence and young adulthood (Jena et al., 2013).

One may also consider the Festinger’s cognitive dissonance theory to explain the high consumption of tobacco products despite awareness of its harmful effects. (Lim et al., 2009) This theory postulates that dissonance or psychological turmoil occurs when a person has two or more conflicting cognitions (behaviour and attitude).

To reduce this dissonance, the smokers get compelled to either change their attitude towards smoking or stop smoking. Since it is easier to change attitude as compared to behaviour, most tobacco consumers tend to develop a positive attitude towards tobacco consumption instead of quitting it. (Cooper, 2007) Behavioural changes required to change the tobacco consumption habits are definitely likely to include awareness of harmful effects but that is not likely to be sufficient alone (Prochaska et al., 1992; Strecher et al., 1997).

In addition, the way the knowledge is acquired also influences the consumption behaviour- generalized or personalized (Bien et al., 1993). Generalized knowledge would be related to average detrimental effects on general population whereas personalized knowledge is related to personal risk and likely to be more effective in influencing behavioral change (Rosendahl et al., 2005). Amongst younger population, aesthetic considerations are considered more important than health considerations (Honjo et al., 2003; Rosendahl et al., 2005).

In most of countries where GATS was conducted, there was relatively low awareness levels about risks associated with smokeless tobacco, except Bangladesh and India. This is associated with the fact that smokeless tobacco is perceived as relatively safe and harmless and has shown very high smokeless tobacco consumption prevalence in these countries. There is a need to increase the awareness about harmful effects of smokeless tobacco through media and campaigns similar to the ones conducted against smoking.

In conclusion, it is popularly believed that tobacco consumption (smoking and smokeless) is inversely linked to knowledge, attitudes and perception of population towards tobacco. However, GATS has shown a significant gap between these two parameters. Despite high awareness about harmful effects of smoking, people continue to smoke developing a tolerant attitude towards it. The reasons for this phenomenon remain unclear and need to be studied in further depth.

In addition, the awareness of ill effects of tobacco smoking in most countries remains limited to lung cancer with relatively low awareness about ill effects on cardiovascular system in form of heart attack and stroke. Also, there is surprisingly low awareness about ill effects of smokeless tobacco in most countries. This needs to be rectified by governments and policy makers of respective countries through sustained media and educational campaigns to increase population awareness about the ill effects of smokeless tobacco as well as preventing initiation into tobacco consumption (smoking or smokeless).

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