# ORIGINAL ARTICLE

# The Impacts of Cigarette Packaging Pictorial Warning Labels on Smokers in the City of Tehran

**Gholam Reza Heydari [1], Ali Ramezankhani [2], Firoozeh Talischi [1]**

[1] Tobacco Prevention and Control Research Center, NRITLD, [2] School of Public Health, Shahid Beheshti University of Medical Sciences, TEHRAN-IRAN.

## ABSTRACT

**Background:** Cigarette smoking is considered the first preventable cause of death in the world. Social, familial, and personal factors play an important role in prevention or cessation of smoking. Educating the public in order to enhance their knowledge, change their attitude and improve their habits is also effective in this respect. In 2007, the executive protocol of the Comprehensive Law on Smoking Control was compiled in the Ministry of Health and according to the Article 5 of this law pictorial health warning labels had to be applied on cigarette packaging. This study was designed and conducted in 2 phases of before and 9 months after the implementation of this law and evaluated the effect of it on smokers' knowledge, attitude and pattern of smoking.

**Materials and Methods:** This was a cross-sectional descriptive study conducted to evaluate the effect of cigarette packs' pictorial health warning labels on the knowledge, attitude and smoking pattern of smokers residing in Tehran. After calculating the size of understudy population and estimation of the exclusions, 1731 subjects were randomly selected using the multiphase cluster method from the 22 districts of Tehran. Data were collected using a questionnaire designed according to the standard questionnaire of the World Health Organization (WHO) and International Union Against Tuberculosis and Lung Disease (IUATLD). Qualitative and quantitative value and reliability of the variables including cigarette consumption, knowledge about the law, and pattern of smoking were evaluated in 2 phases and the quality of pictures and their effects on the mentioned variables were assessed in the 2nd phase.

**Results:** Before adopting the pictorial warning labels in the first phase of the study, 1731 respondents were evaluated out of which 71.8% were males and 28.2% were females. These cases had an average of 17.6±12.3 years history of smoking. A total of 38% (675 subjects) used Iranian cigarette brands and 39.5% were aware of the implementation of pictorial health warning labels on cigarette packs. In terms of smokers' attitude towards the implementation of this law, they mostly had no opinion about it. A total of 33.3% stated that they may cut down on smoking as the result of this law. Men had a higher percentage of smoking a cigarette first thing in the morning before breakfast and women had a higher rate of consuming foreign cigarette brands (P<0.001). In the second phase of the study, 1590 cases of the phase 1 subjects participated. Subjects had a significantly higher knowledge about the implementation of pictorial health warning labels on cigarette packs (P<0.001). Attitude towards this law did not change significantly compared to the first phase although the mean score improved by 0.07%. Enforcement of this law resulted in decreased consumption in 7.6% of the participants. However, the Wilcoxon test did not show any significant difference. In terms of the quality of pictures, 61.6% had no opinion, and 28.7% expressed that the pictures had poor quality. No significant difference was observed between the Iranian or foreign brands in terms of smoking rate after applying the pictorial warning labels.

**Conclusion:** We believed that the smoking rate would decrease after applying the pictorial health warning labels on cigarette packs. However, it did not happen. Also, adopting these labels did not have a significant effect on smokers changing their favorite brand from Iranian to foreign brands or vice versa. Type and quality of pictures require major revision and corrections. **(Tanaffos2011; 10(1): 40-47)**

**Key words:** Tobacco, Health warnings labels, Tehran residents

## INTRODUCTION

Cigarette smoking is the most important preventable cause of early deaths, morbidity and mortality in the world (1). Social, familial, and personal factors play an important role in prevention or cessation of smoking (2). Every 6 seconds, 1 person dies as the result of tobacco consumption in the world (3). Smoking results in the death of half the smokers (4) and shortens their life spam for an average of 15 years (5, 6). If necessary actions are not taken to overcome this obstacle, the annual rate of morbidity and mortality due to tobacco consumption will reach to more than 8 million people by the year 2030 (7). If the current pattern of smoking continues, it is estimated that 500 million would die as the result of tobacco consumption (7). During the $21^{st}$ century, consumption of tobacco products will result in the death of more than one billion people (8).

Although there is definitive evidence regarding the health hazards of tobacco consumption, only a small number of smokers are fully aware of the harmful effects of this act. People generally know that smoking is dangerous. However, they think of it as a bad habit that they are knowingly involved with (9). Adopting pictorial health warning labels on cigarette packs improves smokers' knowledge about the health hazards of smoking (10). The effect of pictures showing disease complications is much greater than the text only warnings. Pictorial health warnings are particularly required to target the illiterate population of the world. Studies in Australia (11), Belgium, Brazil (12), Canada (13), Thailand, and some other countries show that health warnings on cigarette packs especially the graphic ones are an important source of information for young smokers
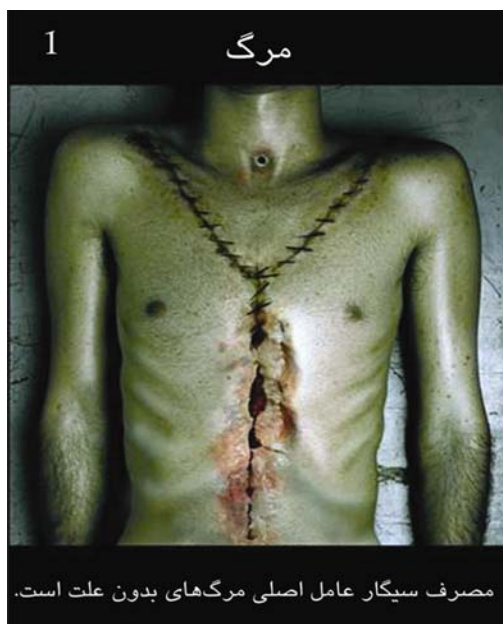
in low education countries. These pictorial warnings especially target the children of smoker parents who are at a greater risk for becoming a smoker themselves. Some countries do not apply any health warning labels to cigarette packs. At present, it is emphasized that the warning labels should be large, bold, very clear and preferably graphic and should at least occupy half the packet and indicate the health hazards of smoking and related diseases. The warning messages should be written in official language of the country in a way that it is easily understandable for the public. Evaluation of the public opinion shows that tobacco free laws and regulations have been greatly appreciated in every country they have been implemented in (14). Iran is a member of the WHO Framework Convention on Tobacco Control. According to the Article 5 of the executive protocol compiled by the National Comprehensive Law on Tobacco Control, pictorial health warning labels should be applied to cigarette packs.

We designed this study to evaluate the effect of cigarette packs' pictorial health warning labels on the knowledge, attitude and pattern of smoking in smokers residing in Tehran.

## MATERIALS AND METHODS

This was a cross sectional descriptive study conducted to evaluate the effect of cigarette packs' pictorial warning labels on the knowledge, attitude and smoking pattern of smokers residing in Tehran. Data were collected in 2 phases: fall 2008 and summer 2009. At the time of study, participants had at least one year history of smoking and were residing in one of the 22 districts of Tehran. A

questionnaire was used for data collection. With the cooperation of the Statistics Center of Iran, using the Tehran map and evaluating the population residing in each district using the PPS method, the required number of subjects from each district was determined. A location was selected in each chosen district randomly and questioning was started from there moving upwards and to the right. Our questionnaire was a self study questionnaire designed according the standard questionnaire of the WHO and IUATLD. Its efficacy and reliability were tested on the first phase of study. Data regarding pattern of smoking, knowledge about the implementation of pictorial warning labels on cigarette packs and smokers' attitude towards it were collected in 2 phases and evaluated using SPSS version 11 software. Relative distribution and frequency of the variables were calculated. Chi square, Wilcoxon, McNemar and spearman's rank correlation coefficient tests were used for comparison between variables and $P<0.05$ was considered significant (Figure 1).
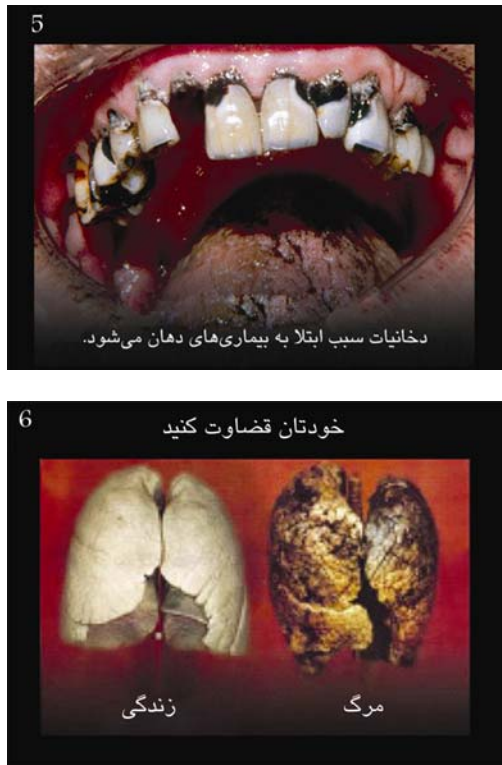


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Figure 1. Pictorial warning labels.

## RESULTS

The results of the first phase demonstrated that 1,731 smokers were questioned out of which, 71.8% were males and 28.2% were females. The mean age was $36.6\pm13.6$ yrs (range 17 to 60 yrs). A total of 41.4% had high school diploma. The mean history of smoking was $17.6\pm12.3$ yrs (range 2 to 44 yrs). A total of 39.2% had their first cigarette within 30 min after waking up and 657 cases (38%) used Iranian cigarette brands. In the first phase, 39.5% were aware of the implementation of pictorial warning labels on cigarette packs, 41.2% had no opinion in this regard and 576 cases (33.3%) predicted that this act may result in decreasing their smoking rate (Table 1).

A total of 39.17% (615 males and 63 females) lit their first cigarette within 30 minutes after waking up in the morning. Males and females showed a statistically significant difference in this respect (P<0.001). Thirty eight percent of the participants used an Iranian brand (47.8% of men and 12.9% of women). Difference in this respect was significant between males and females (P<0.001). A total of 39.5% of the smokers were aware of this new rule. Women had a significantly greater knowledge in this respect (P<0.001). No significant correlation was observed between the knowledge about this new rule and occupation or educational level of participants. Age and knowledge or attitude had no significant correlation either.

In the second phase of the study 1,590 participants were questioned for the $2^{nd}$ time(Table 2). Although Wilcoxon signed-rank test showed no significant decrease in rate of smoking (P=0.86, difference in means: -0.179), 121 persons (7.6%) cut down on smoking compared to their previous consumption rate in phase 1 of the study out of which 88.42% were males. Difference in this regard was statistically significant (P<0.001). No correlation was found between decreased rate of smoking and cigarette brand in terms of domestic or foreign brands (P=0.10). However, a significant correlation was observed between smoking in the first 30 min after waking up and decreased rate of smoking.

In a paired study on 1,590 cases before and after the implementation of pictorial warning labels on cigarette packs the following results were obtained:

Knowledge about this new law increased significant using the Mcnemar's test (P<0.001) (Table 3,4).

Attitude towards the positive effect of this law did not change significantly using the Wilcoxon signed-rank test (P=0.641, difference in means:-0.005).Picture number 4 was selected as the most influential picture among the total 6 which was a picture from a smoker suffering from Buerger's disease (Table5).

Table 1: Demographic characteristics of understudy smokers in Tehran before and after the implementation of protocol.

| Gender | Before | After |
|---|---|---|
|  | No. (%) | No. (%) |
| Male | 1242 (71.8) | 1145 (72) |
| Female | 489 (28.2) | 445 (28) |
| **Knowledge** | | |
| Yes | 684 (39.5) | 1519 (95.5) |
| No | 1047 (60.5) | 71 (4.5) |
| **Attitude** | | |
| Very positive | 360 (20.8) | 329 (20.7) |
| Positive | 501 (28.9) | 453 (28.5) |
| No opinion | 714 (41.3) | 598 (37.6) |
| Negative | 156 (9.0) | 210 (13.2) |
| **Cigarette consumption** | Prediction of consumption | Consumption |
|  | No. (%) | No. (%) |
| More | 396 (22.9) | 191 (12) |
| Same | 759 (43.8) | 1278 (80.4) |
| Less | 576 (33.3) | 121 (7.6) |
| **All respondents** | 1731 (100.0) | 1590 (100.0) |

Table 2. Frequency distribution of cigarette consumption after implementing the pictorial warning labels on cigarette packs based on gender in the 2nd phase of study.

| Gender | | Frequency of cigarette consumption | | | Total |
|---|---|---|---|---|---|
|  |  | Higher | No change | Lower |  |
| Male | No. (%) | 86 (7.5) | 952 (83.1) | 107 (9.3) | 1145 (100) |
| Female | No. (%) | 105 (23.6) | 326 (73.3) | 14 (3.1) | 445 (100) |
| Total | No. (%) | 191 (12) | 1278 (80.4) | 121 (7.6) | 1590 (100) |

Table 3. Frequency distribution of cigarette consumption after implementing the pictorial warning labels on cigarette packs based on age in the 2nd phase of study.

| Age | | Frequency of cigarette consumption | | | Total |
|---|---|---|---|---|---|
|  |  | Higher | No change | Lower |  |
| Younger than 30 yrs | No. (%) | 48 (6.9) | 592 (84.9) | 57 (8.2) | 697 (100) |
| 30-50 yrs | No. (%) | 88 (16.7) | 420 (79.7) | 19 (3.6) | 527 (100) |
| Older than 50 yrs | No. (%) | 55 (15) | 266 (72.7) | 45 (12.3) | 366 (100) |
| Total | No. (%) | 191 (12) | 1278 (80.4) | 121 (7.6) | 1590 (100) |

Table 4. Frequency distribution of cigarette consumption after implementing the pictorial warning labels on cigarette packs based on the time of first cigarette smoking in the morning in the 2nd phase of study

| Time of first cigarette in the morning | | Frequency of cigarette consumption | | | Total |
|---|---|---|---|---|---|
|  |  | Higher | No change | Lower |  |
| In 30 min after waking up | No. (%) | 39 (12.5) | 270 (86.3) | 4 (1.3) | 313 (100) |
| In 31-60 min | No. (%) | 121 (18.5) | 529 (80.9) | 4 (0.6) | 654 (100) |
| After 60 min | No. (%) | 31 (5) | 479 (76.9) | 113 (18.1) | 623 (100) |
| Total | No. (%) | 191 (12) | 1278 (80.4) | 121 (7.6) | 1590 (100) |

Table 5. Frequency of the most influential picture chosen by the respondents.

| Picture number | No. (%) |
|---|---|
| Picture # 1 | 193 (12.1) |
| Picture # 2 | 178 (11.2) |
| Picture # 3 | 369 (23.2) |
| Picture # 4 | 690 (43.4) |
| Picture # 5 | 133 (8.4) |
| Picture # 6 | 27 (1.7) |
| Picture # 7 | 1590 (100) |

## DISCUSSION

Applying pictorial warning labels to cigarette packs is the only definitive way to expose smokers to such warnings. Cigarette manufacturers have always taken advantage of attractive cigarette packaging to propagate their product in the market. Warning labels reverse the efficacy of their marketing.

Implementation of warning labels on cigarette packaging enhances the knowledge of consumers about the harmful effects of tobacco products (10). The effect of pictures of smoking related diseases is much greater than text only warnings. These pictorial warnings are necessary for the huge number of illiterate population of the world in order to inform them about the health hazards of smoking. Studies in Australia (11), Belgium, Brazil (12), Canada (13), Thailand, and some other countries show that health warnings on cigarette packs especially the graphic ones are an important source of information for young smokers in low education countries. These pictorial warnings especially target the children of smoker parents who are at a greater risk for becoming a smoker themselves. Graphic warnings are usually supported and approved by the public and there is rarely an objection towards them. However, cigarette manufacturers oppose this act. Health warnings encourage smokers to quit smoking and can prevent initiation of smoking in the younger population. It also increases public acceptance towards other tobacco control strategies such as creating smoking free zones. This study was conducted in 2 phases (fall 2008 before applying pictorial warning labels and after their implementation in summer 2009) and evaluated the effect of adopting pictorial warning labels as one of the tobacco control programs.

In the first phase, less than 40% of the smokers were aware of the implementation of this law which seems like an unacceptable number. This rate reached 95% in the second phase. There is a possibility that smokers who were not aware of this law where those who used cigarettes with no pictorial labels. Authorities should especially pay attention to this subject and make sure all the cigarette packs available in the market adopt these pictorial warning labels.

In the first phase, almost half the participants had no opinion regarding this action and were unsure about the effects of its implementation. This rate did not change in the second phase of the study. Special attention should be paid to this issue to figure out why this action had no effect on changing the attitude of smokers. Poor quality of the pictures or not so effective messages may play a role in this respect. An important finding was changed rate of smoking in the 2nd phase of study as follows: 33% of smokers in the first phase predicted that implementation of pictorial warning labels would decrease their smoking rate. This figure in the second phase reduced to 7.7%. Although, a small number of smokers actually cut down on smoking or started thinking about quitting as the result of implementation of this act, this rate is acceptable and almost similar compared to other studies' findings (10-12). According to international studies, implementation of this act is beneficial even at such low rates. However, we have to work on finding solutions to increase this rate. This goal can be achieved by improving the quality of pictorial health warnings, selecting influential pictures,

seeking public opinion, and applying pictorial warning labels to the packaging of all cigarette brands.

Our study results demonstrated that smoking rate decreased in men more than women. Also, smoking rate decreased mostly in those who did not smoke in the first 30 minutes after waking up (low nicotine dependence)(18.1% versus 1.3%). Older smokers were more affected by the implementation of this act (12.3% versus 3.6%). Such findings have not been reported in other studies (11, 12). To our knowledge, our study was the first to report such findings.

Another important factor to discuss is the fact that the picture showing a healthy and a diseased lung caught the lowest and the picture depicting laryngeal cancer and Buerger's disease caught the highest attention among smokers. This finding can help in selecting future pictures.

In future, studies designing pictures based on ethical and cultural backgrounds should be evaluated.

This study was conducted in 2 phases before and after the implementation of pictorial health warnings. This way we could evaluate the effect of this law. Our study results demonstrated that these pictorial warnings did not have any effect on changing the attitude of smokers on cutting down or quitting smoking. Also, smokers' prediction about decreasing the rate of smoking after the implementation of this act did not come true and decreased consumption occurred in only 7% of cases. However, this rate is acceptable and almost similar to those reported by foreign studies. More influential pictures are required in order to achieve the goals set for tobacco control.

## CONCLUSION
### Phase 1:
- Consumption of foreign cigarette brands was more than 60%
- About 60% of the smokers were not aware of this act

- Nicotine dependence was greater in men
- Consumption of foreign brands was higher among women
- Nicotine dependence was greater in smokers older than 50 years old
- Consumption of Iranian cigarette brands was higher among those over 50 years old
- Knowledge about this law was greater among women
- Almost half the smokers did not have a positive attitude towards this law and did not think it would be effective
- 33% of smokers did not think that they would cut down on smoking after the implementation of these warning labels

### Phase 2:
- Knowledge about the law enhanced significantly
- Still more than half the smokers did not have a positive attitude towards this law and did not think that it would be effective
- About 7% of smokers stated that they had cut down on smoking. This decrease in smoking rate was greater in males (almost 3 times higher), older ages (almost 4 times greater), and those with low nicotine dependence (almost 10 times greater)
- About 10% of smokers believed that the quality of the attached picture was good. No significant difference was detected in this respect based on age, sex or nicotine dependence.
- Smokers chose the picture of Buerger's disease and laryngeal cancer as the most influential graphic pictures. No significant difference was observed in this regard according to age, sex or nicotine dependence

### Final conclusion
- Foreign cigarette brands are more popular than domestic brands and are mostly consumed by women and people of younger ages
- Knowledge about the implementation of pictorial health warnings on cigarette packs has significantly enhanced

- Attitude towards the positive effect of this act has remained unchanged
- Prediction of decrease in smoking rate following the implementation of this act did not come true
- Smokers believe that picture of a laryngeal cancer and Buerger's disease is the most influential ones.

## Acknowledgement

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