ORIGINAL ARTICLE

Awareness about pictorial warnings on tobacco products and its impact on tobacco consumers in coastal Karnataka

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Abstract

Background: Tobacco use is a major risk factor for many chronic diseases, including cancer. India revised the pictorial warnings on all tobacco products in 2018, but its impact on tobacco consumers after the revision is less studied. **Aim and Objective:** To assess the awareness of the revised pictorial warnings on tobacco products and the impact of it on tobacco consumers in a coastal town. **Methods:** This cross-sectional study was conducted from 1st to 31st March 2021 among 185 adult tobacco consumers in a coastal town in Karnataka after obtaining ethical clearance and informed consent. The data was analysed using SPSS version 16.0 by descriptive statistics, Chi-square, Fisher's exact test and binary logistic regression analysis. **Results:** Majority (95.7%) were males and 96.2% had seen the pictorial warning on the tobacco products. The commonly consumed tobacco products were panmasala (44.9%), gutka (38.9%), cigarette (31.4%) and bidi (15.1%). The mean age of initiation of consuming tobacco products was 24.8 years and mean duration of the habit was 17 years. **Conclusions:** A majority (96.2%) have seen the pictorial warnings on the tobacco products and significant predictors for reducing tobacco consumption were those who inferred the pictorial warnings as tobacco is injurious to health and cancerous.

Keywords

Tobacco Product; Cigarette; Awareness; Bidi; Gutka.

Introduction

Tobacco use is a major risk factor for many chronic diseases, including cancer. India is the second-largest consumer and producer of tobacco. Tobacco accounts for nearly 1.35 million deaths every year. The total economic costs attributed to tobacco use amounted to USD 27.5 billion.(1) 28.6% of all adults in India and 22.8% of all adults in Karnataka currently use tobacco (smoked and/or smokeless tobacco).(2,3) 38.0% of adult men and 8.9% of adult women used one or more tobacco products.(4)

Till 2020, more than 40 countries have implemented pictorial warnings on cigarette packages.(5) In India, since 2009, the implementation time and specifications of the pictorial warnings were varied and underwent many changes which required to cover 85% of the front and back of the pack, with different warnings for smoked and/or smokeless tobacco products.(6,7)Ministry of Health and Family Welfare, India amended the Cigarettes and other Tobacco Products (Packaging and Labelling) Rules with new pictorial warnings coming into force on the first day of September, 2018.(8)Studies have shown that despite existing tobacco control policies, not only does the

number of juveniles and young tobacco users continues to rise unabated, but also those diseases, disabilities, and deaths attributed to tobacco use increased considerably.(9)

Aims & Objectives

1. To assess the awareness of the pictorial warnings used on tobacco products among the tobacco consumers in a coastal town in Karnataka.
2. To assess the impact of the current pictorial warnings on tobacco consumers in a coastal town in Karnataka.

Material & Methods

Study Type: This was a cross-sectional study.

Study Area: The study was conducted in Kumta, a coastal town in Karnataka.

Study Population: The study was conducted among the tobacco product consumers in the study area.

Inclusion Criteria: The study participants included persons aged 18 years and above, residing in Kumta (coastal town) for minimum of past one year and who consumed tobacco products (smoke and/or smokeless).

Exclusion Criteria: The participants who were unwilling to give written informed consent and/or refused to participate in the study were excluded.

Study Duration: The study was conducted over a period of two months (1st March to 30th April 2021).

Sample Size calculation: Sample size was calculated using the formula, $n = Z_{\alpha/2}^2\ pq\ /e^2$, where 'p' was the percentage of people who had awareness about pictorial warnings on tobacco products, which was 61.9% as per Global Adult Tobacco Survey (GATS) India 2016-17(2), standard normal deviate ($Z_{\alpha/2}$) at 5% i.e., 1.96 and allowable error (e) of 7% was considered and the sample size hence calculated was 185.

Working Definitions:

Tobacco consumer: A person presently consuming tobacco products in any form (smoke and/or smokeless).

Pictorial warnings: Image 1 and 2 on tobacco products as per Ministry of Health And Family Welfare, Government of India, Cigarettes and other Tobacco Products (Packaging and Labelling) Second Amendment Rules, 2018 dated 3rd April 2018[G.S.R. 331(E)].(8)

Strategy for data collection: There were 23 council wards in the Municipal Council of Kumta. One tobacco selling outlet in each council ward was selected randomly. From each of the selected tobacco selling outlet, eight study participants were consecutively selected. The selected study participants were interviewed using a pre-tested and semi-structured proforma through face-to-face interview method. The data collected included socio-demographic characteristics, awareness about pictorial warnings, and the effect of the pictorial warnings on the habit of study participant's tobacco consumption.

Ethical Approval: The study was conducted after obtaining clearance from the Institutional Ethics Committee (Ref.No.IEC/KIMS/O/16/2020-21).

Consent: A written informed consent was obtained from the study participants before interviewing them.

Data Analysis – Software: The data was cleaned, coded and analysed using Statistical Package for the Social Sciences (SPSS) version 16.0 software [SPSS Inc. Released 2007. SPSS for Windows, Version 16.0. Chicago, SPSS Inc.]. The results were interpreted in terms of mean, standard deviation, percentages, and proportions. The factors influencing awareness about pictorial warnings were analysed using Chi-square, Fisher's exact test and binary logistic regression analysis. A p-value less than 0.05 was considered statistically significant.

Flow Diagram (Figure 1**)**

Results

The total study participants were 185 of which 95.7% were males and 4.3 % were females. The mean age of study participants was found to be 42.8 years with standard deviation of 13 years. 32.5% of study participants had completed their primary schooling followed by high school (24.3%). 18.9% of them were graduates and above whereas 12.4% were illiterates. 65.9% of them belong to Class IV of the modified Prasad SE classification and most of them were from nuclear families.

This study found that majority were consuming pan masala (44.9%) and most of them purchased it loose (47.6%). 81.6% of the study participants spent less than fifty rupees per day for purchasing tobacco products with a mean expenditure of 46.8 rupees per day. 58.4% were in the age group 20-30 years while starting the consumption of tobacco products with the mean age of initiation being 24.8 years. 68.1% of the Study participants were consuming tobacco products for ≥10 years with mean duration of habit being 17.9 years (Table 1).

The reasons for starting tobacco usage shows curiosity (50.3%) as the most common reason, followed by peer pressure (15.7%) and family problems (14.1%). Other reasons found were to perceived increased work performance, to keep oneself awake, and influenced by actors. Univariate analysis of awareness about the pictorial warning among the study participants shows that, majority (96.2%) had seen the pictorial warnings on the tobacco products. Age group and occupation were found to have a significant association with observing the pictorial warnings on tobacco products. (Table 2)

The present study also assessed the inference of participants after seeing the pictorial warnings and the most common inference was that tobacco consumption was injurious to health (46.6%) followed by cause of cancer (17.4%) and Government order (14.6%). Other inferences found were it causes lung problems, something related to manufacture, it was dangerous to health, to scare and as poison. 42.1% of the study participants

reduced their consumption of tobacco products after seeing the pictorial warning (Table 3).

In our study, binary logistic regression analysis revealed that, the significant predictors of the pictorial warnings on tobacco consumption of the study participants were perceived increased performance [OR= 584.86 with C.I (3.47 to 98600) & p=0.015], duration of habit for 20 –30 years [OR= 25.29 with C.I (1.46 to 439.22) & p=0.027], inference drawn after seeing the pictorial warnings as injurious to health [OR= 0.006 with C.I (0 to 0.26) & p=0.008], inference drawn after seeing the pictorial warnings as cancerous [OR= 0.009 with C.I (0 to 0.52) & p=0.023], other reasons (disbelief, habituated) for pictorial warnings to be non-influential [OR= 0.008 with C.I (0 to 0.22) & p=0.004] and the reason for not quitting tobacco products consumption as unwilling to quit [OR= 6.77 with C.I (1.23 to 37.19) & p=0.028] affected the habit of the study participants after seeing the pictorial warnings. Other predictors like gender, age groups, education, occupation, marital status, type of family and expenditure on tobacco products had no significant impact on the tobacco consumption habit and hence were not included in the table. Omnibus test of model coefficient shows a significant improvement in fit as compared to the null model. Also, Hosmer & Lemeshow test shows that model is a good fit i.e. there is no significant difference between the observed & predicted model. Nagelkerke R^2= 0.748 (pseudo R-square) i.e. 74.8% of the change in the criterion variable can be accounted to the predictor variables in the model. Percentage accuracy in classification was 88.6% i.e. overall the model correctly classified 88.6% of the cases. Sensitivity of the predicted model over observed model was 89.2% and Specificity was 88.2% (Table 4).

Discussion

Monitoring patterns and trends in tobacco use and exposure are key to combatting the tobacco epidemic and there was a need to accelerate the implementation of the WHO FCTC and its Protocol. Tobacco control was an integral part of the development agenda, contributing not only to Sustainable Development Goal 3 (Target 3.a call for strengthening implementation of the WHO FCTC in all countries) but also to the achievement of other targets, directly or indirectly impacted by tobacco growth and use.(10)Health warnings on tobacco packages have a broad population reach and represent a direct and prominent means of communicating the risks of tobacco use.(11)The present study with 185 participants, with a majority of them being males who were educated till primary or high school, belonging to class IV of modified Prasad socioeconomic classification and to nuclear families. Similar observations was made by Vanishree N et al.(11), Yaddanapalli, et al.(12), Oswal KC et al.(13), Majumdar A et al.(14), V R Shah et al. (15) in their studies.

In the present study when study participants were assessed for tobacco products usage practices, the majority of them were using the smokeless form of tobacco like pan masala or gutka with the mean age of initiation for consuming tobacco products as 24.8 years and mean duration of the habit was 17 years. Mode of purchase for the majority was loose with daily expenditure less than fifty rupees. As per the Global Adult Tobacco Survey fact sheet Karnataka 2016-17 the mean age at initiation of tobacco use as 19.8 years and betel quid with tobacco, bidi and gutkha are the three most commonly used tobacco products in Karnataka.(3)Similar observations were made by Oswal KC et al.(13) and VR Shah et al.(15) in their studies in terms of using the smokeless form of tobacco, Whereas Karinagannanavar et al.(16)Karipasappa GN et al.(17)Dahiya, et al.(18) and Rahman M et al.(19) in their studies have revealed cigarette smoking is most common. VR Shah et al. in their study have found 54.9% were using tobacco in any form for more than 10 years(15) whereas Dahiya, et al. in their study found that the duration of the habit was less than ten years (73.1%)(18)Reasons for starting of usage of tobacco products revealed that most common reason as out of curiosity which means that attitude of exploring or adventure could have made them try and continue the tobacco use. Other reasons are peer pressure, family problems, increased work performance, to keep awake and some are even influenced by actors/movies. Chopra A et al. in their communicating tobacco health risks study have found that the major reasons attributed to consuming tobacco were stress and peer pressure.(20)

In the present study, most of the participants have seen the pictorial warning on tobacco products. Similar studies done by Vanishree N et al.(11), Chopra A et al.(20) Karipasappa GN et al.(17)Oswal KC et al.(13)found 92.6%, 90%, 73.4% and 68.8% respectively having seen the pictorial warning on tobacco products. It was observed that age group and occupation were significantly associated with the observing the pictorial warning. Majority of them inferred that tobacco was injurious to health or it causes cancer or lung problems which means that they know the ill effects of tobacco on health but sill they did not reduce the consumption which was not a good attitude because the main purpose of displaying the pictorial warnings on tobacco products was to make them quit/reduce consumption of tobacco.

In the present study, the study participants who inferred the pictorial warnings as injurious to health and as cancerous had 0.006 times and 0.009 times lesser chances of continuing the habit respectively as compared to the person who didn't infer anything about the pictorial warnings.

The study participants who perceived increase work performance with tobacco consumption had 584.86 times, who had the habit of tobacco consumption for 20 - 30 years had 25.29 times and who were unwilling to quit

had 6.77 times more chances of continuing the habit of tobacco consumption even after having seen the pictorial warnings. Those who had started tobacco consumption 20-30 years ago did not have an opportunity of seeing the pictorial warning on tobacco products during their early habit forming years.

As per the findings of the European commission-fiftieth of smokers reported that health warnings have been effective in getting them to smoke less and in helping them try to quit.(21) In countries with pictorial health warnings, such as Canada and Australia, the impact of warning labels was high. More than 40% of Canadian smokers report that the pictorial warnings have motivated them to quit smoking. While among Australian smokers, 57% reported that the labels made them think about quitting.(22,23)

Dahiya, et al. in their study on found that more than two-thirds of the respondent was aware of the statutory and pictorial warnings, and tobacco users believe that the presence of pictorial and text warnings had no impact on them. The whole objective was to communicate not only with tobacco users but also with prospective quitters and probable initiators.(18) Arora M, et al. in their ineffective tobacco health warnings in India study inferred that majority of the respondents who were tobacco users would continue to use tobacco and would not contemplate quitting even after observing the warnings.(24) In a multicounty study in the European Union, a higher proportion of current smokers had reported either cutting down the number of cigarettes/day or making a quit attempt). This could be because of the fact that people in countries of the European region generally belong to a higher socioeconomic class along with the higher education levels, as compared to India, and thus, the chances of warnings having an effect on quit attempts were higher among smokers in those counties.(25) In another study, 14% of smokers reduced smoking, and 5% attempted to quit smoking after seeing health warnings on cigarette packs (both pictorial and textual).(26) Hence our study found that the impact of pictorial warning on tobacco consumers was less effective in making them reduce consumption or quit.

Conclusion

In the present study, majority (96.2%) had seen the pictorial warnings on tobacco products. Among those who had seen the pictorial warnings, 42.1% of the study participants reduced their consumption of tobacco products after seeing the pictorial warning. The significant predictors for reducing tobacco consumption were those who inferred them as tobacco is injurious to health and cancerous. Among those who had seen the pictorial warnings, the significant predictors for not reducing tobacco consumption were those who perceived that tobacco consumption increases work performance, long duration of tobacco consumption (20 – 30 years) and unwillingness to quit.

Recommendation

Sensitizing the tobacco consumers by continuation of the revised pictorial warnings (2018) on tobacco products shall help in creating awareness about the harmful effects of tobacco consumption and motivate them to quit. Creating awareness through pictorial warnings early in the habit forming years may motivate them to reduce or quit the consumption of tobacco products.

Limitation of the study

Our study was conducted in a selected coastal town within short time period. The ongoing COVID-19 pandemic and restrictions could have influenced the present study in lesser number of tobacco consumers visiting the tobacco products selling outlets.

Relevance of the study

This study not only assessed awareness about revised pictorial warnings (2018) on tobacco products by Ministry of Health and Family Welfare, Government of India, but also assessed the impact on their tobacco consumption among the study participants. This helps in knowing the usefulness of revised pictorial warnings on tobacco products.

Authors Contribution

HNG, NPM, UM designed the study, reviewed the literature, collected and analysed the data. HNG, MU, SS wrote the manuscript and revised it. MNM conducted the data analysis, revised the manuscript. KH supported in the design, providing critical inputs for manuscript revision and fund management of the study. All authors approved the final version of the manuscript.

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Tables

TABLE 1 TOBACCO PRODUCTS USAGE

Variable	Number (n=185)	Percentage
Tobacco product consumed		
Cigarette	58	31.4
Bidi	28	15.1
Gutka	72	38.9
Panmasala	83	44.9
Khaini	2	1.1
Total	243*	131.4*
Mode of Purchase		
Single	53	28.6
Loose	88	47.6
Packs	44	23.8
Expenditure per day (INR)		
< 50	151	81.6
50 - 150	26	14.1
≥ 150	8	4.3
Starting Age (in Years)		
< 20	31	16.2
20 - 30	108	58.4
30 - 40	37	20.0
≥ 40	9	5.4
Duration of habit (in Years)		
< 10	59	31.9
10 - 20	49	26.4
20 - 30	31	16.8
30 - 40	31	16.8
≥ 40	15	8.1

TABLE 2 UNIVARIATE ANALYSIS OF AWARENESS ABOUT THE PICTORIAL WARNING (N=185)

Variable	Seen Pictorial warning Yes (178) n (%)	No (7) n (%)	Chi-Square	p-value
Age Group (Years)				
< 20	2 (1.1)	0 (0)	**14.11**	**0.028***
20 - 30	30 (16.9)	2 (28.6)		
30 - 40	53 (29.8)	0 (0)		
40 - 50	35 (19.6)	0 (0)		
50 - 60	34 (19.1)	1 (14.3)		

Variable	Seen Pictorial warning		Chi-Square	p-value
	Yes (178) n (%)	No (7) n (%)		
60 - 70	21 (11.8)	3 (42.8)		
≥ 70	3 (1.7)	1 (14.3)		
Gender				
Male	171 (96.1)	6 (85.7)	1.745	0.187
Female	7 (3.9)	1 (14.3)		
Education				
Illiterate	21 (11.8)	2 (28.6)	5.659	0.341
Primary	56 (31.4)	4 (57.1)		
High School	45 (25.3)	0 (0)		
Pre-University	22 (12.4)	0 (0)		
Graduate and above	34 (19.1)	1 (14.3)		
Occupation				
Home maker	1 (0.6)	1 (14.3)	**19.152**	**0.004***
Unemployed	61 (34.3)	5 (71.4)		
Unskilled	48 (26.9)	0 (0)		
Skilled	37 (20.8)	0 (0)		
Semi-Professional	20 (11.2)	0 (0)		
Professional	11 (6.2)	1 (14.3)		
**statistically significant association*				

TABLE 3 INFERENCE AFTER SEEING THE PICTORIAL WARNING AND ITS EFFECT ON HABIT

Variable	Number (n=178)	Percentage
Inference		
Injurious to health	83	46.6
Cancer	31	17.4
Government order	26	14.6
Lung problems	15	8.4
Something related to manufacture	8	4.5
Danger	7	3.9
To scare	6	3.4
Poison	2	1.1
Effect of pictorial warning on habit		
Reduced consumption	75	42.1
Did not reduce consumption	103	57.9

TABLE 4 BINARY LOGISTIC REGRESSION ANALYSIS SHOWING THE IMPACT OF PICTORIAL WARNINGS ON THE HABIT OF THE TOBACCO CONSUMERS (N=178)

		Effect of warning Picture on the Habit		Odd's Ratio	95% C.I for Odd's Ratio		P-value
		Reduce/Quit (75)	Didn't Reduce (103)(Ref)		Lower	Upper	
Reason for starting	Peer Pressure	13	16	Ref			
	Out of curiosity	36	51	6.39	0.70	58.15	0.10
	Perceived increased performance	1	6	**584.86**	**3.47**	**98600**	**0.015***
	To keep awake	2	5	17.10	0.12	2490	0.26
	Influenced by actors & movies	3	4	1.46	0.004	492.30	0.89
	Family problems	9	16	2.74	0.16	48.31	0.49
	Without any valid reason	9	3	0.18	0.009	3.39	0.25
	Others	2	2	0.57	0.009	35.31	0.79
Duration of the Habit (Years)	< 10	27	31	Ref			
	10 - 20	17	31	0.76	0.09	6.60	0.81
	20 - 30	12	19	**25.29**	**1.46**	**439.22**	**0.027***
	30 - 40	14	16	17.09	0.73	402.18	0.08
	≥ 40	5	6	3.43	0.06	189.44	0.54
Suffering from any Disease	No	57	94	Ref			
	Yes	18	9	0.723	0.10	5.14	0.75
Inference	Don't Know	1	17	Ref			
	Govt. Order	7	17	0.05	0.001	4.45	0.19
	Injurious to Health	45	38	**0.006**	**0**	**0.26**	**0.008***
	Something related to manufacture	3	5	0.097	0.001	13.37	0.35
	Shadow	1	1	0.06	0	33.19	0.39
	Danger	4	3	0.01	0	1.27	0.06
	Poison	0	1	$2.97*10^5$	-	-	1
	It's fake	1	5	0.14	0.001	14.09	0.41
	Cancer	11	12	**0.009**	**0**	**0.52**	**0.023***
	Lung problems	1	3	0.58	0.001	398.67	0.87
	Others	1	1	2.70	0.006	1320	0.75

		Effect of warning Picture on the Habit		Odd's Ratio	95% C.I for Odd's Ratio		P-value
		Reduce/Quit (75)	Didn't Reduce (103)(Ref)		Lower	Upper	
Why didn't the picture Influence?	Didn't Understand	4	12	Ref			
	Not Effective	38	61	0.17	0.02	1.81	0.14
	It's fake	10	22	0.08	0.004	1.80	0.11
	Others (disbelief, habituated)	23	8	**0.008**	**0**	**0.22**	**0.004***
Reason for not quitting	Addiction	17	20	Ref			
	Doesn't know the method to quit	11	9	0.38	0.02	6.79	0.51
	Unwilling to quit	47	74	**6.77**	**1.23**	**37.19**	**0.028***
Constant				$1.64*10^{18}$			0.99

Cox & Snell R^2= 0.556 Nagelkerke R^2= 0.748; Omnibus test of model coefficients was significant, χ^2= 143.007 with p < 0.001andAccording to Hosmer & Lemeshow test, the model was a good fit, χ^2= 8.235 with P = 0.411; Overall percentage accuracy in classification was 88.6%

Figure

FIGURE 1 FLOW DIAGRAM