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Effect of graphic images (on cigarette packets) on the smoking habits among medical students at Tabuk University

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ABSTRACT— Tobacco smoking is the driving cause of preventable death and diseases worldwide. Graphic warning labels on cigarette packaging are now mandatory in 77 countries to minimize smoking-related deaths. The current study aimed to assess the effect of graphic images (on cigarette packets) on smoking habits among medical students at Tabuk University. A cross-sectional study was conducted to assess the effect of graphic images on the student behaviour regarding smoking; the study was conducted among 259 medical students in Tabuk University during the period from August to October 2021. A structured web-based questionnaire was used to collect the data. The first part collected demographic data and the second part assessed the effect of graphic images on smoking habits and consisted of eleven Likert scale items (six questions were four items and five had three responses). The Statistical Package for social Sciences was used for data analysis. There were 259 medical students (80.2%) and interns (9.2%), 39.6% were males, and more than a half-heard about tobacco risks the physicians and their families. Cancer images (either specified or not) were the most effective images (48.6%) followed by dead people in 29%. While health concerns were the most common reason (44.1%) for quitting followed by religious reasons in 21.2%. Tobacco images were effective in quitting promotion in 66.1% of students. No differences were evident between males and females regarding the effects of graphic images (26.33±6.35 versus 24.91±6.81, 95% CI, -0.26-3.09, P-value, 0.099). However, graphic images were more effective on smokers than non-smokers (27.50±6.75versus 24.95±6.53, 95% CI, -.054-4.55, P-value, 0.099). Tobacco images were effective in quitting promotion, Cancer images were the most effective followed by dead people. While health concerns were the most common reason for quitting.

KEYWORDS: Graphic images, tobacco warnings, medical students, Saudi Arabia

1. INTRODUCTION

Tobacco smoking is the driving cause of preventable death and diseases worldwide [1]. Despite extensive preventative efforts and growing public knowledge of its health risks, tobacco continues to kill almost 6 million people per year throughout the world [2], it also causes about 480,000 deaths in the United States (US) per year [3]. The Gulf countries were defined as having a high consumption rate where the average daily smoker was more than or equal to 20 cigarettes per day [4]. Cigarette packs are an important vehicle in marketing, World Health Organization (WHO) adopted pectoral images on the consequences of smoking on cigarette packs (article 11) [5]. Since its first implementation in Australia, France, the UK, New Zealand,

and Norway in 2018 [6], plain packs faced resistance from tobacco companies [7]. The effectiveness of plain packs on quitting is controversial and is affected by various factors [8].

Graphic warning labels on cigarette packaging are now mandatory in 77 countries to minimize smoking-related deaths [9]. Graphic warning labels often consist of a text message accompanied by a frightening color image, such as a picture of blackened lungs or gangrene infected feet. Because fear may be a powerful incentive for changing one's habits. The text messages on warning labels are intended to educate people about the dangers of smoking, such as 'Cigarettes cause fatal lung disease [10]. The use of graphic warning labels on cigarette packs as a platform for communicating with smokers and the public became increasingly significant [11].

2. Literature review

[12] conducted a cross-sectional survey of 90 participants and found that images showing pathologies were more effective, especially among non-smokers. A study conducted in Saudi Arabia [13] supported the use of graphic images. However, some of the participants viewed the details on the package are vague. The recommendations were concentrating on aggressive images, while community leaders thought that aggressive warnings might be culturally and religiously inappropriate. A randomized controlled trial conducted in the USA found that graphic images are more effective in quitting than text-only warnings [14]. Thinking about smoking risks, credibility, and negative affective reactions to smoking were the main mediators. Further studies from Thailand [15] showed that graphic images directly contributed to Technology students' danger associated with smoking and perceived health risks. Combining both pictorial depictions and text messages is most effective in inducing quitting [16]. The current study aimed to assess the effect of graphic images (on cigarette packets) on smoking habits among medical students at Tabuk University.

3. Subjects and Methods

Research design: A cross-sectional study was conducted to assess the effect of graphic images on the student behavior regarding smoking; the study was conducted among 259 medical students in Tabuk University during the period from August to October 2021.

Setting: Faculty of Medicine, University of Tabuk, 792 students.

Sample size calculation: the study sample was calculated using a web-based sample calculator. size=259 https://www.calculator.net/sample-size-calculator.html?type=1&cl=95&ci=5&pp=50&ps=792&x=58&y=14We [17]

Measures: A self-administrated web-based questionnaire was used in a random way among medical students at Tabuk University. The questionnaire consisted of two parts: the first part collected sex, academic year, an idea about graphic imaging, and smoking habits. The second part assessed the effect of graphic images on smoking habits and consisted of eleven Likert scale items (six questions were four items and the response were either not agree=1, not sure=2, agree=3, or strongly agree=4. The remaining five questions response were not agree=1, not sure=2, and agree=3). The total score was 39, students scoring less than 22 (not agree and not sure) were regarded as low score and thus the graphic images were not influential, a score of >22 was regarded as effective in inducing quitting.

Ethical consideration: All the participants were invited to sign a written informed consent and the ethical committee of the University of Tabuk approved the research (ref. no, 197-49-2022, dated, 20/4/2022).

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4. Data analysis

All data that were obtained with the questionnaire were analyzed using the Statistical Package for the Social Sciences (SPSS) version 20. The one-Way Sample T-test was used for continuous variables. Statistical significance was accepted when P-value is less than 0.05.

5. Results

There were 259 medical students (80.2%) and interns (9.2%), 39.6% were males, and more than a half-heard about tobacco risks the physicians and their families. The majority (72.6%) noticed health warnings on cigarettes package, 71% noticed the warning when they came first, while 33.4% preferred the old tobacco package. Nearly a half (44.8%) of the students feel disgusted when they first see the graphic image and 15.7% tried not to look at the pictures. Cancer images (ether specified or not) were the most effective images (48.6%) followed by dead people in 29%, while health concerns were the most common reason (44.1%) for quitting followed by religious reasons in 21.2%.

In the present study, 88.1% of the participant thought that graphic images are credible, 86.3% agreed that tobacco packages should have health warnings, 77.4% agreed that health warnings are was clear and understandable, and 83.1% supported the health warnings. However, only 38.7%, 32%, and 49.4% think the concept of plain packaging will help them in quitting, being attractive, and planning to quit respectively. Tobacco images were effective in quitting promotion in 66.1% of students. Other items of the graphic image effects were shown in table 2.

In the current study, no differences were evident between males and females regarding the effects of graphic images (26.33±6.35 versus 24.91±6.81, 95% CI, -0.26-3.09, P-value, 0.099). Table 3. However, graphic images were more effective on smokers than non-smokers (27.50±6.75versus 24.95±6.53, 95% CI, -.054-4.55, P-value, 0.099). Table 4.

Table 1. The basic character of the study group.

Character	No %
Males	103 (39.6%)
class	
First	18 (6.9%)
Second	18 (6.9%)
Third	48 (18.5%)
Fourth	32 (12.3%)
Fifth	58 (22.3%)
Sixth	50 (19.2%)
Graduates	24 (9.2%)
Smoking	53 (20.4%)
Heard about smoking	
Television advertisement	24 (9.2%)
Health warnings on tobacco packets	42 (16.2%)
Health professionals	77 (29.6%)
Family members	57 (21.9%)
Other people	10 (3.8%)

Social media	38 (14.6%)
Ever read/noticed health warnings on current cigarette packets?	
Yes	180 (72.6%)
No	23 (9.3%)
Don't know	45 (18.1%)
I take more notice of the health warnings (Picture, written warning) when they are new/first come out?	
Strongly agree	111 (44.8%)
Agree	65 (26.2%)
Disagree	26 (10.5%)
Not sure	46 (18.5%)
In the last 30 days, have warning labels led you to think about quitting smoking?	
Yes	
No	44 (24.7%)
Don’t know	46 (25.8%)
	88 (49.4%)
Thinking about the Picture on cigarette/tobacco packaging, what Picture can you recall?	
Baby (Harms unborn)	3 (1.2%)
Lung cancer	9 (3.5%)
Tongue (Mouth cancer)	9 (3.5%)
Throat (Throat cancer)	21 (8.5%)
Heart (Heart disease)	52 (21%)
Sick people/Dead person/Illness/Death (unspecified)	72 (29%)
Cancer (unspecified)	82 (33.1%)
When you see health warnings or health information on a cigarette or tobacco pack, what emotions do you feel? What goes through your mind?	
Disgusted/gross/yuck/ sick etc.	111 (44.8%)
Worried/concerned	24 (9.7%)
Guilty regret/pity/ reluctant /disappointm	26 (10.5%)
Fearful/scared/anxiety/depressed	20 (8.1%)
Must quit/should quit/trying to stop/ will try to stop/ want to stop/ should stop	28 (11.3%)
Relief/I’m no longer a smoker	

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Try not to look/try not to think/ try to ignore	39 (15.7%)
I prefer the original/old packaging to what it is 2weeks.	
Strongly agree	52 (24.8%)
Agree	18 (8.6%)
Disagree	47 (22.4%)
Not sure	93 (44.3%)
Reasons for planning to quit?	
Religious reasons	36 (21.2%)
Social reasons	9 (5.3%)
Economic reasons	11 (6.5%)
Health reasons	75 (44.1%)
Others	39 (22.9%)

Table 2. The items of the plain package questionnaire (eleven items, mean± SD=25.5±6.65)

Character	No %
The credibility of health warning	
Strongly agree	155 (59.6%)
Agree	74 (28.5%)
Disagree	6 (2.3%)
Not sure	13 (5%)
I think cigarette packets should have health warnings.	
Strongly agree	165 (66.5%)
Agree	49 (19.8%)
Disagree	15 (6%)
Not sure	19 (7.7%)
Health warnings on the current cigarette packet were clear and understandable.	
Yes	165 (66.5%)
No	27 (10.9%)
Don't know	56 (22.6%)
In the last 30 days, have warning labels led you to think about quitting smoking?	
Yes	44 (24.7%)
No	46 (25.8%)
Don’t know	88 (49.4%)
Do you support applying the concept of plain packaging in Saudi Arabia (plain packaging is the packaging of tobacco products, typically cigarettes, without	

any branding colors, imagery, corporate logos, and trademarks in addition to the health warnings)?	128 (51.6%)
Yes	78 (31.5%)
No	42 (16.9%)
Don't know	
Do you think the concept of plain packaging will help you in quitting?	
Yes	75 (38.7%)
No	46 (23.7%)
Don't know	73 (37.6%)
Do you find the new plain packaging more attractive?	
Yes	65 (32%)
No	64 (31.5%)
Don't know	74 (36.5%)
How effective are the Pictures on packs at communicating the health effects of smoking?	
Very effective	59 (27.8%)
Effective	74 (34.9%)
Not effective	34 (16%)
Not sure	45 (21.2%)
Would you say the inclusion of pictures and health information on cigarette/tobacco packs has improved your knowledge of the health effects of smoking?	106 (42.7%)
Strongly agree	64 (25.8%)
Agree	34 (13.7%)
Disagree	44 (17.7%)
Not sure	
The health warnings on the packs make/made me think about quitting.	
Strongly agree	38 (20.5%)
Agree	44 (23.8%)
Disagree	36 (19.5%)
Not sure	67 (36.2%)
Plan to quit smoking	
Strongly agree	56 (33.7%)
Agree	26 (15.7%)
Disagree	35 (21.1%)
Not sure	49 (29.5%)

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Graphic image overall effect Effective Not effective	 164 (66.1%) 84 (33.9%)

Table 3. Quitting scores across gender

Character	Males	Females	95% CI	P-value
Quitting score	26.33±6.35	24.91±6.81	-0.26-3.09	0.099

Table 4. Quitting score according to smoking status

Character	Smokers	Non-smokers	95% CI	P-value
Quitting score	27.50±6.75	24.95±6.53	-.054-4.55	0.016

6. Discussion

In the present study, 20% of the sample were smokers which are higher than a recent study published in Jazan, Saudi Arabia (12.4%). Our findings are lower than a study published in Nepal and found a prevalence of 30.1% [18], [19]. A plausible explanation might be the conservative nature of the Saudi Community.

The current study found that graphic images on cigarettes package were effective especially among smokers (95% *CI,* -.054-4.55) in agreement with a randomized controlled trial published in the USA found that images on cigarette packets increase quitting cognition and decrease smoking perception among adults [20]. Farrelly and colleagues from the USA [21] confirmed the previous observation. The effect of graphic images seems to be more among affirmed than no-affirmed smokers and least among affirmed non-smokers [22], the present results showed more effect among smokers. In addition, health-related threats are more unpleasant than social threats [23]. A randomized controlled trial published in Australia showed that written warnings are less efficacious than when accompanied by cosmetically important harms [24]. However, both approaches did not decrease the smoking rate in contradiction to the present observation. [25] found that changing behavior is effective in promoting cigarette quitting and not graphic images. The type of image might explain the contradicting findings. Images focusing on death and cancer are more effective than others focusing on infertility and impotence [26]. A study conducted in Vietnam and adopted lung damage images was shown to reduce smoking demand in particular among lower socio-economic classes; Katyal et al reported similar findings from the USA [27], [28]. The current sample is high social class and the graphic images are more likely to promote quitting. Further studies from Korea found that unpleasant graphic images increased quitting intention [29]. Showing a dying smoker and graphs with loss of physical attractiveness were aversive among smokers and non-smokers in New Zealand [30]. In addition, the effects of graphic images are influenced by ethnicity, education, and smoking habit [31]. In addition to cognition and emotion (suffering and injury graphs are more efficient, especially when featuring damage to children) [32], [33]. The effect on cognition needs refreshment every five years, a study from Australia concluded [34]. An interesting study conducted in Ohio State of the USA found that low-emotion graphic images decreased intention to smoke in contrast to high emotion graphs [35]. Age-related positivity effects might be useful among elderly people [36]. Further studies showed that images combining both deception and disgust might be more influential than graphs displaying one attribute [37]. The type and position of disease seem to be important when choosing graphic images. The type of the disease is also important, a study

published in Vietnam showed that displaying images of lung and throat cancer and heart disease are more dreadful than those showing tooth loss [38].

7. Conclusion

Tobacco images were effective in quitting promotion, Cancer images were the most effective followed by dead people. While health concerns were the most common reason for quitting. Further multi-center studies focusing on wider populations with different ethnicities and culture are needed.

Conflicts of interests: None to declare.

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