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AN EVALUATION OF THE EFFECTS OF COMBINED HEALTH WARNINGS ON CIGARETTE PACKETS THROUGH EYE MOVEMENTS

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Abstract. *Smoking is the source of fundamental health problems. Activities have been organised throughout the world so that smokers and non-smokers do not encounter smoking-related health problems in society. One such activity is the combined health warnings designed to be printed on cigarette packets. The warnings on cigarette packets are considered as an instrument of education to develop the desired attitudes in individuals by improving their knowledge of health. This research aims to evaluate the effects of 14 combined health warnings printed on cigarette packets on smokers and non-smokers. This is a descriptive research, and it employs a correlation model. The research group was composed of 57 individuals participating in the research on the basis of volunteering. The data were collected through eye-tracking and by means of two forms. According to the findings, the combined warnings on cigarette packets were moderately influential and they were remembered at low levels. It was also found that the participants were familiar with the combined warnings on cigarette packets and that they avoided the warnings. These results demonstrate that the warnings should be re-evaluated by taking diverse demographic properties into consideration.*

Key words: *cigarette packet, combined health warnings, eye movements, university student, health education.*

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Introduction

The harm of smoking and its fatal effects are widely known today. Smoking, which has been influencing societies for a long time, is at the top of the list of preventable causes of death (Hammond, Fong, McDonald, Cameron & Brown, 2003). One out of 10 deaths in the world is caused by smoking. One third or half of those who use tobacco die 15 years earlier due to health problems. It is predicted that approximately 1 million people will die of smoking-related causes in the 21st century unless smoking can be harnessed (WHO, 2008). For this reason, more than 170 countries support the Framework Convention on Tobacco control (FCTC) of World Health Organisation (WHO) today (Ministry of Health, 2012). With this convention which is widely supported, the intention is to raise consciousness in terms of the effects of tobacco use on health, to reduce tobacco consumption, and to prevent taking up tobacco use (Ministry of Health, 2012). For these purposes, efforts are made to reach the masses of people by printing health warnings on cigarette packets and with advertisements containing warnings. However, printing health warnings on cigarette packets is preferred more than using advertisements through mass media due to the fact that it is a low-cost method and that smokers are more exposed to cigarette packets (Brown, Reidy, Weighall& Arden, 2013; Süssenbach, Niemeier & Glock, 2013).

The basic assumption underlying the efforts to explain the effects of smoking on health through warnings is that people are unconscious of the issue. Yet, most tobacco users keep using tobacco even though they know its harm. According to the Theory of Cognitive Dissonance, such individuals

ignore the truth while using tobacco, and they even forbid their sub-conscious to make mention of it (Festinger, 1957). In consequence, many tobacco users can tend to underestimate the diseases probable to be caused by tobacco use. Moreover, misbeliefs stemming from users' lack of knowledge are also available. Such beliefs inhibit the perception of health problems probable to arise.

Health education firstly aims at primary prevention (protecting from illnesses). Several studies claim that health warnings are effective in informing individuals of the negative effects of smoking (Bansal-Travers, Hammond, Smith & Cummings. 2011; Hammond et al. 2003; Kessel and Reuter, 2012). Canada was the first country to print combined warnings (a combination of graphs and written texts) on cigarette packets. Canada printed those warnings on cigarette packets in 2011in a manner so as to cover 50% of the area of a packet (Hammond, 2011). Turkey signed the FCTC in Geneva on 28.04.2004. In this context, 14 combined warnings were determined by Tobacco and Alcohol Markets Regulatory Authority in accordance with Regulation on Procedures and Principles for the method of production, labelling and control for protection from the harm of Tobacco products (see Figure 1). In 2012 it was made obligatory to print the 14 warnings in blue, red, yellow and black to cover 65% of one of the two surfaces of cigarette packets (TAMRA, 2012). Companies shall be required to plan and implement their manufacturing and importation programs in a way to ensure that each combined warning appears by 5 % to 9 % of the time during a period of 14 months and separately on each of the different types of products. Yet, no information as to the criteria according to which these warnings - which are obligatory to implement – have been determined was found.

It was demonstrated through studies conducted that the combined warnings predicted to be printed on cigarette packets raised the levels of knowledge of health (Brown et al. 2013, Crespo, Cabestrero, Grzib & Quiros, 2007; Kessels and Ruiter, 2012). Combined warnings printed on cigarette packets are considered as a vehicle to develop the intended attitudes in individuals (Strahan, White & Fong, 2002). However, the effects of warnings can differ according to societies. Therefore, it is important for studies to have demonstrated that the warnings have the expected effects.

It is also seen in the literature that psycho-physiological techniques such as eye-tracking are rather objective and qualitative in terms of evaluating the effects of stimulants (Maynard et al. 2014; Shankleman, Sykes, Mandeville, Di Costa & Yarrow, 2015; Süssenbach, Niemeier & Glock, 2013). Participants' pupils are monitored in various methods during eye-tracking test, and the point of attention of the eye is determined through trigonometric calculations (Krugman, Fox, Fletcher, Fischer& Rojas, 1994). Most of the eye tracking devices available on the market measure eye's points of looking through corneal reflection/pupil-centre methods (Doolan, Breslin, Hanna, Murphy & Gallagher, 2014). Such eye trackers are composed of an infrared camera integrated into a standard computer monitor. Along with such hardware, picture processing software positioning and explaining the properties of the eye is used. Infrared light coming out of the embedded LED infrared camera is directed inside the eye to cause strong reflections in the targeted areas of the eye and to facilitate eye-tracking. The rays enter the retina, cause the pupil to look brighter and thus they are reflected to a large extent. Meanwhile, image processing software determines the center of the pupil and the position of corneal reflection. Vector between the two is measured and the eye's point of attention in determined through various trigonometric calculations (Kalaycı, Tüzün, Bayrak, Özdinç & Kula 2011; Maynard, Munafo & Leonards, 2013). Visual attention is the mechanism uncovering the parts of our visual area related with the task performed by excluding the unnecessary information. Eye-tracking provides important information on participants' conscious and unconscious responses by using this mechanism (Crespo, 2007; Mogg,Bradley, Field& Houwer, 2003).

Problem of Research

The purpose of the research is to evaluate the effects of combined health warnings available on cigarette packets on smokers and non-smokers. In line with this purpose, answers are sought in this research to the following questions:

1. Are there any significant differences between smokers and non-smokers in terms of the number of and average time of focusing on the graphs and written texts on cigarette packets?
2. Are there any significant differences between genders in terms of the effects of warnings printed on packets on individuals and in terms of being recalled on average?
3. What is the rank of average influence of the warnings on packets for smokers and non-smokers?
4. What is the status of the warnings in terms of being recalled for smokers and non-smokers, and what is individuals' eye gaze heat map for the combined warnings?

Methodology of Research

This is a descriptive research and it uses a correlation model. In this approach, efforts are made to describe the data for such different factors as the topic of interest, individuals and groups separately. Thus, the research aims to evaluate the results according to whether or not smoking according to gender is based on the variables in the questions posed above. Therefore, the pilot and main applications of the research were performed in the period between September 2015 and January 2016 with students of five different universities in Ankara.

Participants

The participants were determined on the basis of volunteering. The "Applied Ethics Research Centre" of the universities where the research was conducted approved the ethical permission for the research. Prior to the research, the participants were asked to sign a "Form of Voluntary Participation" in which they were informed of the research. After that, whether or not the participants had any visual impairment was checked via Snellen Eye Tracking (Mogg et al., 2003). Two individuals with visual impairment were excluded from the research, and 67 volunteer university students in total participated in the research. Yet, 10 of them were removed from the group due to various reasons. In consequence, the research group was composed of 57 participants (29 male and 28 female). Of the participants, 28 (49%) were smokers, whereas 29 (51%) were non-smokers. Fagerström Test for Nicotine Dependence was applied to the smokers prior to the research in order to determine their smoking addiction (Fagerstrom, 1978). Consequently, 15 (54%) of them were found to be very slightly addicted and 13 (46%) to be slightly, moderately and highly addicted. The participants' age ranged between 18 and 24. Average age was 21.26 (SD=1.76).

Data Collection Tool

In this research, participants' eye movements were recorded through Tobii T120 monitor type eye-tracking device. This device which is integrated to the computer monitor follows participants in terms of where in the screen they look, how long they look and how many times they look at it during the test at the speed of 120 hertz per second. Tobii T120 eye-tracking device works on 17" 1280 X 1024 pixel TFT screen with precision under 0.5 degree. Tobii Studio software was used in collecting data on eyes. Tobii Studio is software that transforms the information it receives from the receiver and reflector infrared cameras integrated onto a monitor into visual and numerical data and records and then present various vehicles to analyse the data so that Tobii T120 Eye Tracking Device collected the data most effectively, the participants were seated at 60-70 cm distance from the monitor. Before the test started, calibration was done at 9 points that Tobii Studio provided automatically.

The remaining data were collected by using the Form for Recall and Effect that was administered to the participants at the end of the application. 14 blanks were included in the Recall Form, and the participants were asked to write or draw the combined health warnings in the blanks provided.

Procedures

A pilot research was conducted in order to determine the presentation for use in data collection. The 14 combined health warnings determined by TAMRA were taken from the relevant web page (TAMRA, 2008). Three pictures of landscape (in total 42 different landscape pictures) were also added so as to distract attention. Three computer presentations were designed in which the combined warnings and pictures had differing sizes, and a black spot was put before each warning in the presentations for calibration.

HW1: Smokers die younger.

HW2: Smoking clogs the arteries and causes heart attacks and strokes.

HW3: Smoking causes fatal lung cancer.

HW4: Smoking when pregnant harms your baby.

HW5: Protect children: don't make them breathe your smoke.

HW6: Your doctor or your pharmacist can help you stop smoking.

HW7: Smoking is highly addictive, don't start.

HW8: Stopping smoking reduces the risk of fatal heart and lung diseases.

HW9: Smoking can cause a slow and painful death.

HW10: Get help to stop smoking

HW11: Smoking may reduce the blood flow and causes impotence.

HW12: Smoking causes ageing of the skin.

HW13: Smoking can damage the sperm and decreases fertility.

HW14: Smoke contains benzene, nitrosamines, formaldehyde and hydrogen cyanide.

Figure 1: Fourteen combined health warnings determined by TAMRA.

The three presentations were tested with six participants three of whom were smokers and three of whom were non-smokers during the pilot research. Following the application, it was decided to use the combined health warnings taken from the Web page of Tobacco and Alcohol Markets Regulatory Authority in their original size (12.62 cm X 13.3 cm). Black spots of the size 1.2 cm X 1.1 cm were put before the warnings for calibration purposes. Decision was made to put each of these black spots on the right or left hand side of the screen before each warning. The aim in doing so was to prevent that the first area participants look at was the area of warnings, and thus to assure data reliability. The pictures of landscape decided to insert before warnings had 640*480 pixel resolution and size of 27.94 cm X 15.72 cm. Thus, the presentation prepared by including black spots after the two landscape pictures and just before the warnings contained 56 slides in total. The presentation was edited on the Tobii Studio software in a manner so as to last 140 seconds (4 seconds for each slide of combined warning, 2 seconds for slides with black spots). After the data concerning the participants' eyes were recorded, they were placed in another room and were asked to complete the Recall and Evaluation Forms there.

Data Analysis

Descriptive statistics (arithmetic average, standard deviations, etc.) and normality test were conducted for the variables. Whether or not there were any significant differences between males and females (gender) and between smokers and non-smokers (status of smoking) was checked by using independent t-test at .05 significance level. The source of difference according to the results of the t-test was found via Levene Test. Moreover, content analysis was done for the Recall Form.

Table1. Data concerning the normal distribution of variables.

Variables	Mean	St. Dev	Skewness	Kurtosis	K-S test	p
All areas fixation count	180.16	20.36	-0.29	0.62	0.07	0.20
Graphical areas fixation count	63.30	20.80	0.32	0.62	0.10	0.20
Written text areas fixation count	114.44	27.50	-0.85	0.49	0.10	0.20
All areas fixation duration	38.71	5.26	-0.95	0.78	0.11	0.06
Graphical areas fixation duration	16.97	6.52	-0.05	-0.87	0.08	0.20
Written text areas fixation duration	21.35	6.66	0.82	0.46	0.12	0.04

According to the Table 1, the Skewness and Kurtosis coefficients of all variables are below absolute value 1, and the data do not deviate significantly from normal distribution (Çokluk, Şekercioğlu & Büyüköztürk, 2010). The results of Kolmogorov-Simirnov test performed to test whether the values for the variables distributed normally showed that the statistics calculated for only the written text area fixation duration scores was 0.04 whereas the statistics for the other variables was bigger than 0.05. On considering the test of normality results and descriptive statistics together, it may be said that it is possible to perform the t test for independent groups to compare the averages. Based on the smallness of number of data in the groups, parametric and non-parametric tests were performed for each transaction so as to test the accuracy of the results. Having seen that parametric and non-parametric tests yielded similar results, it was decided to present the results for parametric test in the article (Çokluk, Şekercioğlu & Büyüköztürk, 2010).

The data obtained with the recall form were divided into four levels of recall. The levels were as in what follows: "*Incorrectly written or blank*", "*written in the form of a note*", "*the warnings were written conceptually correctly*," and "*written down correctly in the blanks provided*". The minimum and maximum score receivable from the form for each item ranges between 1 and 4. Four independent researchers graded the statements written by the participants in the forms. Grading made by these researchers was compared, and 85% agreement was found between them initially. Then the researcher discussed instances of grading having no agreement and full agreement was reached in terms of grading the data. In this way, reliability was attained in the research. Making detailed descrip-

tions on the participants' backgrounds validated the research, whether or not they smoked, whether or not they suffered from visual impairment, their gender and average age. The other form used in data collection was the Effects Evaluation Form. The participants were asked in this form to evaluate to what extent the combined health warnings were effective in terms of quitting smoking between 1 (not effective at all) and 9 (very effective). The scores that the participants obtained from the form for each item were between 1 and 9.

Results of Research

This part of the research contains the results that are obtained from analysing the data. Accordingly, it was determined whether or not there were any significant differences between smokers and non-smokers in terms of average values of fixation duration and fixation count on the graphical areas and written text areas printed on cigarette packets in accordance with the first problem of the research. The results for independent t test performed for graphical areas fixation count (GA_{FC}), written text areas fixation count (WTA_{FC}), graphical areas fixation duration (GA_{FD}), and written areas fixation duration (GA_{FD}) scores are shown in Table 2.

Table 2. Independent t-test results for average values of fixation duration and fixation count on the graphical areas and written text areas on cigarette packets according to smoking status.

Variables	Smoking status	N	Mean	Std. Dev.	t	p	Levene statistics	Levene p value
Graphical areas fixation count (GAFC)	Smoking	28	69.75	17.76519	2.4	0.02	2.07	0.16
	Non-smoking	29	57.069	21.88759				
Written text areas fixation count (WTAFC)	Smoking	28	103.5714	23.12355	-3.16	0.01	0.68	0.41
	Non-smoking	29	12.,931	27.66242				
Graphical areas fixation duration (GAFD)	Smoking	28	18.73	5.83854	2.06	0.04	0.36	0.55
	Non-smoking	29	15.2745	6.78211				
Written text areas fixation duration (WTAFD)	Smoking	28	18.7114	5.49988	-3.17	0.01	1.29	0.26
	Non-smoking	29	23.9014	6.76734				

As seen from Table 2, significant differences were found at the level of 0.05 between individuals' score averages for GA_{FC}, WTA_{FC}, GA_{FD} and GA_{FD}. The differences were in favour of smokers for the variables of GA_{FC} and GA_{FD} whereas they were in favour of non-smokers for the variables of WTA_{FC} and WTA_{FD}. Based on these results, it may be said that smokers' score averages for graphical areas fixation count and fixation duration are significantly higher than those of non-smokers'. In consequence, it was found that smokers looked at and focused more on graphical areas on cigarette packets while non-smokers looked at and focused more on written text areas.

The findings of the second question of the research were summarized as in the Table3.

Table 3. Independent t-test results for the differences between the effects of warnings on cigarette packets on individuals and individuals' levels of recall score averages.

Variables	Gender	N	Mean	Std. Dev.	t	p	Levene statistics	Levene p value
Total efficacy	Female	28	86.75	19.75	3.13	0.01	3.05	0.09
	Male	29	67.83	25.42				
Total recall	Female	28	21.61	3.31	0.02	0.98	1.88	0.18
	Male	29	21.59	4.01				

According to Table 3, a significant difference was found between women's and men's total efficacy scores in terms of the effects of combined warnings at the level of 0.05 in favour of women. According to this result, it is obvious that the averages for total efficacy scores for the effects of warnings are higher for women than for men. Thus, the combined warnings on packets can be said to influence women more than men. The differences between men's and women's recall average scores, on the other hand, were not found significant at the level of 0.05. This situation demonstrates that there are no differences between male and female participants' levels of recalling the warnings on the packets.

The results of the third question of the research are shown in Table 4 for smokers and non-smokers.

Table 4. The results of mean points of effect form for smokers and non-smokers.

Smoking Status	Smoking		Non-smoking	
Variable	Health Warnings	Mean	Health Warnings	Mean
The mean of effect form points	HW4	7.61	HW4	7.59
	HW5	6.75	HW5	6.79
	HW3	6.50	HW3	6.79
	HW2	5.68	HW13	6.41
	HW9	5.57	HW2	6.28
	HW14	5.54	HW11	6.28
	HW12	5.32	HW9	6.21
	HW13	5.32	HW8	6.17
	HW8	5.29	HW14	5.83
	HW11	5.18	HW12	5.76
	HW1	4.50	HW1	5.03
	HW7	3.86	HW7	4.55
	HW6	2.79	HW10	3.97
	HW10	2.71	HW6	3.83

The mean points of effect form for all participants are 5.5.

It may be said accordingly that the warnings having the most and the least effects (For smokers: HW4: 7,61, HW10: 2,71, For non-smokers: HW4: 7,56, HW6: 3,83) on smokers and non-smokers are similar in terms of ranking. According to Table 4, all warnings apart from HW 4 have relatively high averages for non-smokers. The average effect of warnings for all smoking and non-smoking participants are at the moderate level (5.5) (see Table 4).

The data concerning the fourth question of the research are shown in Table 5 and in Figure 2.

Table 5. The mean of recall scores for smokers and non-smokers.

Smoking Status	Smoking		Non-smoking	
Variable	Health Warnings	Mean	Health Warnings	Mean
The mean of recall scores	HW13	2.54	HW13	2.14
	HW12	2.43	HW3	1.90
	HW3	1.86	HW11	1.86
	HW11	1.75	HW12	1.83
	HW5	1.68	HW9	1.48
	HW9	1.64	HW5	1.45
	HW4	1.61	HW10	1.41
	HW1	1.50	HW1	1.38
	HW10	1.43	HW7	1.31
	HW14	1.36	HW2	1.31
	HW2	1.18	HW14	1.28
	HW8	1.11	HW8	1.28
	HW6	1.07	HW4	1.21
	HW7	1.04	HW6	1.21

The mean of recall scores for all participants is 1.54

Accordingly, the warnings recalled most and least by smokers and non-smokers are similar in terms of ranking. Yet, while warning HW12 is available in the first three order for smokers, HW11 is available for non-smokers. Similarly, HW7 is available in the final three order for smokers and HW4 and HW6 are available for non-smokers. Another results is that non-smokers have relatively higher score averages for the 3 warnings at the top, and that smokers have relatively lower score averages for the 3 warnings at the bottom. It is apparent that smokers' recall levels for warnings HW13 and HW12 are the second level (warning in in the form of a note), and their recall levels for all remaining warnings are the first level (incorrectly written or blank). Non-smokers' recall for HW13 is at the second level and their recall for all the remaining warnings is at the first level. It was found that the average for recalling the warnings was at the first level of two warnings (HW13 and HW12), and at the second level for the remaining warnings according to smoking status. The average recall for all participants (1.54) was at the first level.

The visuals concerning the fourth research problem are shown in Figure 2. Accordingly, one or two spots are usually focused on visual areas, and wide areas are not looked at. It was also found that different parts of written text areas- the parts containing keywords such as pregnant, children, smoke, fatal, lungs, blood vessels, blocks, paralysis, slows down, impotence, painful, slow death, nitrosamines, formaldehyde, hydrogen cyanide, skin, and early aging- are focused on. In some warnings the visual and written text parts were equally looked at (HW1, HW3, HW4 and HW12), while in some others (HW2, HW5, HW6, HW7, U30 HW8, HW9, HW10, HW11, HW13 and HW14) written text parts were looked at more.

Figure 2: Visuals for participants' eye gaze heat maps for the warnings.

Discussion

Warning all smokers and non-smokers of a society against the harm of smoking is one of the goals of WHO and of FCTC (Hammond, 2011). In this context, health warnings are printed on cigarette packets today to assure that individuals avoid smoking (Süssenbach, Niemeier & Glock, 2013). Therefore, this research analysed the effects of 14 combined health warnings printed on cigarette packets. In this context the results of the research are discussed in this section of the paper.

The results of the first question of the research show that smokers look at and focus more on the graphical areas of the warnings, whereas non-smokers look at and focus more on the written text areas of the warnings. Maynard et al pointed out that smokers' visual attention for written text warnings was less (Maynard et al. 2014). The researchers interpreted this result as smokers' gradual familiarisation with health warnings or as intentional avoidance. Accordingly, increase in the rate of encountering combined warnings on cigarette packets and rotating them at shorter intervals are considered important.

Warnings should exhibit the risks and negative health effects of smoking, cause fear, attract attention and arouse interest on the part of lookers. The warnings should also convey information on sources for quitting smoking (such as struggling with smoking, coping with smoking, etc) to smokers. According to the results, concerning the second research problem, total score averages for the effects of warnings on female smokers are higher than the ones for the effects of warnings on male smokers. Based on this, it can be said that the combined warnings on cigarette packets are better at affecting women. Approximately 11 million men and 3 million women smoke in Turkey (Ministry of Health, 2012). Accordingly, it is considered important to develop warnings that have more impacts on men. It was also found in this research in relation to the second research problem that there were no differences between men's and women's levels of recalling the warnings on cigarette packets. Effect and Recalling are mutually interactive (Crespo, 2007; Institute for Global Tobacco Control [IGTC], 2013). Warnings with high levels of effect are expected to be recalled at higher levels. This research has found that the average level of recalling was low for the warnings. This result makes us think that more comprehensive tests and trials should be performed for combined warnings.

Results concerning the third question of the research show that the warnings by which smokers and non-smokers are influenced most and least are similar in ranking. Accordingly, we see that all warnings apart from one (HW 4) have relatively high averages for non-smokers, and that all participants are influenced at moderate levels. It is known that remarkable visuals or objects are processed by individuals faster and that they cause bias. This is related with visual attention (Crespo, 2007). Studies show that there is more inclination towards striking warnings than towards other warnings (Bansal-Travers, Hammond, Smith & Cummings, 2011). This is called attention bias (Waters & Feyerabend; 2000). Attention bias can differ according to individuals, lives and habits. According to this result, a change in the content (graphics, colours, etc.) and organisation of warnings can prevent the reduction in the effect of warnings. The results show that the existing arrangement of graphics, colours and organisation of the warnings should be changed.

Warnings on packets do not guarantee avoiding smoking (Mogg et al, 2003). There are two ways in increasing the attention catching effects of warnings (Barlow & Wogalter, 1993). One way is to reduce the intensity of background image and to make it simpler. The other is to use attractive and bigger warnings attracting readers' attention (Hammond et al. 2003). Young and Wogalter (1990) point out that bigger warnings with proven attractiveness are more likely to be recalled. Viscusi, Magat & Huber (1986) state that bigger warnings are found more remarkable by participants. Results in relation to the fourth problem of the research show that the warnings the most and least recalled by smokers and non-smokers were similar in ranking. Yet, while warning HW 12 was at the top three orders for smokers, HW 11 was at the top for non-smokers. Average recall was at the second level for HW 13 and HW 12 according to smoking status and it was at the first recall level for all the other warnings, and real was at the first level for all participants. Visual chaos in the area where eyes look is a factor influencing recalling the warnings (Crespo, 2007). The degree of effect is high for combined warnings that are connected with coping and fear behaviours (Kessels and Ruiter, 2012). Bigger warnings containing more threatening messages combined with such behaviours are thought to be remembered and be influential at higher levels. The research results also indicate that the warnings are recalled at low levels. Therefore, it is necessary to design larger combined warnings which are composed of coping and fear behaviours and which have less intensity of images.

Additionally, results in relation to the last question of the research demonstrate that participants fix their eyes on certain areas of combined warnings, that they do not look at wide areas, and that they looked at certain parts of written text messages. The parts focused contain such key words as pregnant, children, smoke, fatal, lungs, blood vessels, blocks, paralysis, slows down, impotence, painful, slow death, nitrosamine, formaldehyde, hydrogen cyanide, skin, and early aging. This result shows the importance of using effective disincentives related with health and sexual life as key words. That is to say, the importance of composing the written texts of warnings by using phrases of threatening messages is clear. In this context, it is also a widely known fact that individuals focus on key words in warnings (Mogg et al. 2003). This research has also tested the accuracy and validity of results reported in the literature. Yet, it should not be forgotten that warnings are recalled at low levels, and that participants focused on written text areas of warnings again and again to understand the technical and other concepts- which might have been stemmed from need to read again. Besides, graphic areas and written text areas were looked at equally in 4 combined warnings; and written text areas were looked at more in 10 warnings. Recalling in combined warnings is directly proportional with complementariness of graphic parts and written text parts and their being supportive of each other. Visual chaos in the area looked at is a factor capable of changing effect levels (Crespo, 2007). These results lead us to think that the current combined warnings should be re-evaluated and expanded in the context of the results obtained in this research.

Conclusions

Combined warnings on cigarette packets are an important source of medical knowledge and an instrument of education. Health education firstly aims at primary prevention (protecting from illnesses). Efforts have been made to train men and women and smokers as well as non-smokers trough combined warnings on cigarette packets since childhood. In this context, the combined warnings on cigarette packets are used so as to develop the desired attitudes in individuals. It was found in this research that the participants were familiar with the combined warnings on cigarette packets and that they avoided the warnings. It may be recommended in this case that the exposure to and the rotation of the combined warnings on cigarette packets be more frequent, and thus avoidance be prohibited. It was also found in this research that smokers and non-smokers looked at and focused on differing parts (graphics and texts) in combined warnings. In addition to that, female and male participants were found to be influenced by the combined warnings in different ways. These findings show that combined warnings should be designed by considering gender and whether or not individuals smoke. It is important that such demographic properties be taken into consideration in further research to be performed in the future.

The high levels of effects and recall in relation to the combined warnings on cigarette packets is important in terms of the quality of education. Consequently, it was found in this research that the levels of effects and recalling the combined warnings were not high. Therefore, new combined warnings in which there is no visual complication and in which graphics and texts support each other should be designed and thus further research should be performed.

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