



Original Research Article

## Health Risk Perceptions: Population Trends, Mass Media Coverage and the Role of the State

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### ABSTRACT

Risk perception is multi-dimensional and influenced by a wide range of social, cultural and political processes. The aim of the current paper was to explore the health risk perceptions of the population, along with the perceived ability of the state, experts, mass media and individuals to face or present health risks adequately. Data were collected in September 2013, in Greece, through a telephone survey using a representative national sample of 1,227 adults. Data analysis was performed using descriptive and logistic regression. The results indicated that more than 90% of Greeks considered environmental pollution, chemical residues in food and smoking as the top three hazards for their personal health, whereas obesity was deemed hazardous for a smaller number of respondents. Also, more than the 3/4 of the respondents reported that mass media present health risks with a tone of exaggeration or serve specific interests, with less than 40% of the respondents having a positive standpoint for the presentation of health risks from the mass media. According to the findings, less than one in five participants claimed that the state and public health facilities are able to face health risks, a viewpoint, which indicates that the state need to upgrade healthcare facilities and services in order to sufficiently face health risks.

**Keywords:** risk perception; health; mass media; state; Greece

### INTRODUCTION

Risk has various meanings without a unique definition being universally acceptable by both experts and the public, who use different definitions of “riskiness”.<sup>(1,2)</sup> Risk perception research dates back to the 1960s, in the innovative work of Sowby<sup>(3)</sup> and Starr,<sup>(4)</sup> who pioneered in the establishment of the relevant field, linking risk perception with personal and social factors.<sup>(5)</sup> Risk perception - meaning beliefs about potential harm - are included in the majority of health behaviour theories; however, the strength of the association between perception and behaviour is not clear.<sup>(6)</sup> It has been argued that risk

perception per se is not sufficient for a person to construct an intention.<sup>(7)</sup>

Risk perception is multi-dimensional and influenced by a wide range of social, cultural and political processes.<sup>(8)</sup> Therefore, risk cannot be explored separately as an theoretical entity on its own, since there are different kinds of factors (e.g. psychological and social) influencing decision-making toward either healthy or risky behaviours.<sup>(9)</sup> It is clear that risk perceptions do not always correlate well with the actual severity of health risks.<sup>(10)</sup> There are significant differences on how the public and experts perceive certain health risks,<sup>(8-11)</sup> in fact, what differentiates these stakeholders from

the lay public is the way they perceive the importance of risks. <sup>(12)</sup> Public perception of health risks has been considered as subjective and emotional, whereas experts' perception of risks has been viewed as objective and rational, while scientific appraisal of risk is questioned by the public, encompassing issues of trust towards science as well. <sup>(11)</sup> For example, pedestrians often tend to underestimate the possible hazards from crossing a city street, but consider exposure to the radiation derived from human activity as highly hazardous, although it is a fact that most persons are less likely to be exposed to such radiation. <sup>(10)</sup> It has been shown that social norms of the dominant institutions (such as government and corporations) influence individual perceived risk of radiation, in fact, the outcome of a study indicated the importance of the socio-cultural context within the meaning of a health risk has been constructed. <sup>(13)</sup>

On the contrary, according to psychology, although highly-perceived personal risk is necessary for empowering change of risky behaviours, is not sufficient. <sup>(14)</sup> In other words, a person might adopt a hazardous behavioural pattern (such as smoking) refusing to discontinue this behaviour because of certain barriers such as: a) low perception of the risk, b) low perception of its severity, c) high perception of the possible benefits of the current behaviour, d) low perceived efficiency of the recommended action, e) highly perceived cost of the recommended action, and/or f) low self-confidence in the successful practice of the recommended action. <sup>(14)</sup> Further, the antecedents and consequences of health risk perception have been reported by Menon et al., <sup>(15)</sup> who suggested that the antecedents of health risk perception are categorized to the five core types of psychological factors (i.e. motivational, cognitive, affective, and contextual antecedents; and individual

differences), while the behavioural consequences of health risk perceptions are: awareness; interest; trial; adoption; repetition; and endorsement/word-of-mouth. It is clear that perceived risks influence various types of individual decisions, from the type of the car one will buy to the type of the insurance, which will be chosen. <sup>(16,17)</sup>

Undoubtedly, mass media can influence public risk perception and *vice versa*, while they often present information that has been inadequately explained to the public; for example, mass media refer to technical terminology without explaining it to the receiver of the message. <sup>(18)</sup> Mass media play a significant role in the arena of risk information, because they will not cover the actual/'objective' hazard, but rather other social or political activity around it; a fact which has been deemed acceptable by certain theorists. <sup>(19,20)</sup>

Two theories have dominated the field of risk perception research: a) the 'psychometric paradigm' - according to which risk is defined subjectively by individuals, who are influenced by social, psychological, cultural, and institutional factors - and b) the 'Cultural Theory' - according to which persons follow specific patterns of social relationships, which make them perceiving the world (and risks) in distinct ways, and vice versa, plus, there are four viable "ways of life,": hierarchy, egalitarianism, individualism, and fatalism. <sup>(21-23)</sup> The psychometric paradigm has been the method that has been mostly used in risk perception research. Some distinguished theorists of this were Fischhoff, Slovic, and Lichtenstein, who first paved the way. <sup>(1,24-27)</sup> Regarding the study of risk perceptions, it is more common in relevant research to include the undesirable consequences of risk that concern physical harm, while excluding other types of risks; however, the undesirable consequences related to physical harm are those that are mostly accepted

across societies and cultural contexts. (21,28,29)

A study (30) on the swine flu outbreak has shown that the belief that one might catch the swine flu, along with the assertion that the consequences in that case would have been severe, were associated with behavioural change. Levels of anxiety are deemed essential in persuading individuals to adopt the recommended health behaviours but do not explain why this change is so temporary; this could be explained through analysis of risk perception since research on this field has shown that persons are more afraid of risks, when the latter are new to them. (31) Moreover, based on the results of a meta-analysis, (6) the perceptions of specific hazards were found to be the predictors of vaccination acceptance or refusal, proving that risk perception are rightfully considered as a core concept in health behaviour theories.

Risk perception research has shed light on how a whole society perceives a given hazard and at individual level, (32,33) thus, through the implementation of interventions of public health, the perceived risk could be lessened, along with the overall improvement of health level. (33) Based on all of the above, the increase in the knowledge about the power - and the multidisciplinary nature - of the association between risk perception and subsequent health behaviours, can not only enrich the existing knowledge on health behaviour, but it also may provide guidance on the development of relevant interventions. (6) The aim of the current paper was to explore the health risk perceptions - regarding personal, regional and global risks - of the public, along with the perceived ability of the state, experts, mass media and individuals to face or represent health risks adequately. Socio-demographic indicators were also considered in the analyses.

## MATERIALS AND METHODS

Data were collected in September 2013 through a telephone survey focusing on the public opinion concerning health risks and health information. The telephone survey was performed using a structured ("fixed-choice") questionnaire of 51 items. The development of the questionnaire was influenced by the Health Information National Trends Survey (HINTS) 4 - Cycle 2 (official website: <http://hints.cancer.gov/hints4.aspx>). The survey was conducted using electronic questionnaire with the CAWI system. A representative national sample of 1,227 persons (687 males) was selected, who were above the age of 18 and lived in the 13 administrative regions of Greece - according to the national demographic census of 2001 by the Hellenic Statistical Authority (EL.STAT.) The highest standard error was 2.8% with confidence interval of 95%. For more information on the socio-demographic characteristics of the sample, see header rows on Table 1 and Table 2.

### *Study Variables*

The exact research question, which was used in order to assess what Greeks perceive as detrimental for the state of their health was: 'Which of the following hazards do you recognize as detrimental for your personal health?' Participants were given the following list of ten health risks, which were selected as representative of common personal, regional and global risks in Greece: 1) Climate change; 2) Exposure to sun; 3) Mobile phone antennas (Ionizing radiation from mobile telecommunications); 4) Smoking; 5) Passive smoking; 6) Genetically modified food; 7) Chemical residues in food; 8) Obesity; 9) Epidemics; 10) Environmental pollution. Then, respondents were presented with a small list of statements about the ability of the state and the private sector to face health risks. These statements were: 'The Greek state and public health services can control the risks

that threaten public health'; 'The Greek state and public health services are ready to face effectively public health risks and crises'; 'The private health sector can face the risks that threaten public health in Greece'; 'Personally, I can face the risks that threaten my health'. The question that assessed the perceived validity and reliability of the information on health risks, which the experts (scientists) provide to the public was: 'Do you believe that experts present the risks that threaten health in a valid and reliable way?'. Finally, the respondents' perception on how the media present health risks was assessed with the following variables: 'Within the past few years, we often witnessed various health risks. Would you say that the presentation of such issues by the mass media: 1) 'Is valid and reliable?'; 2) 'Has a tone of exaggeration?'; 3) 'Serves specific interests?'; 4) 'Contributes to the information and protection of public health?'

External reviewers translated the survey into English and back-translated it into Greek, while the author checked the translation and back-translation twice to confirm that the original meaning had not been altered. Information on the main socio-demographic indicators (i.e. gender, age, occupation, geographical area, marital status, health insurance, and perceived household welfare) of the respondents was also collected.

### ***Statistical Analysis***

The association of all study variables with the socio-demographic indicators was initially investigated using Pearson's chi-square. In order to further investigate, which health risks are perceived as most hazardous, in association with the perception of how the mass media present health risks and the perceived ability of the Greek state to control and face health risks, two logistic regression models were conducted. For the first model, the dependent variable was created by combining the answers of the

four questions related to mass media so as to indicate a positive perception or not. More specifically, the relative questions were: 'Within the past few years, we have often witnessed various health risks. Would you say that the presentation of such issues by the mass media:' 1) 'Is valid and reliable?'; 2) 'Has a tone of exaggeration?'; 3) 'Serves specific interests?'; 4) 'Contributes to providing information and ensuring the protection of public health?' The response categories for these specific questions were recoded into binary: 1='yes/probably yes'; and 0='no/probably no'. After inverting the answers of the two questions that indicated negative perception (questions 2 and 3), the new variable was computed as: 1=answers indicating positive perception in three out of the four questions asked; and 0=not. The dependent variable of the second model was a combination of the two questions concerning to the ability of the state to face and control health risks, indicating positive perception of the state and public health organisations (i.e. answers indicating positive perception in both questions) or not. The independent variables of both models were health risks-the perceived level of hazard of each health risk. Final models contained only statistically significant variables. Cases with missing data for any variables were excluded from each model's analysis. Statistical significance was set at  $p < .05$ . All analyses were performed using the SPSS version 19.0.

## **RESULTS**

As shown in Table 1 and Table 2, respondents first and foremost perceived environmental pollution (98%), chemical residues in food (95.8%) and smoking (91.8%) as extremely or quite hazardous for their personal health. The health risks less perceived by the respondents as extremely or quite hazardous, were obesity (61.7%), climate change (62.6%), and mobile phone antennas (69.5%). Less than 20% of the

respondents reported that the state/public health services were ready or able to face health risks, whereas almost 60% of the respondents believed that they are able to face health risks on their own. More than 88% of the participants stated that the mass media have a tone of exaggeration or serve specific interests when presenting health risks, while less than 41% of the respondents stated that the mass media present health risks in a valid and reliable way or contribute to providing information and ensuring the protection of public health.

Males considered smoking and obesity as hazardous for their health more than women (93.8% and 67.0% versus 89.4% and 55.1%, respectively,  $p < 0.01$ ). Furthermore, males seemed to trust the state and public health services regarding their readiness to face or ability to control health risks (23.5% and 25.4% versus 11.3% and 12.4%, respectively,  $p < 0.001$ ). On the other hand, women, more than men, considered mass media as valid and reliable and, at the same time, as factors, which contribute to the provision of information and ensuring the protection of public health (37.4% and 47.1% versus 31.4% and 34.7%,  $p = 0.031$  and  $p < 0.001$ , respectively).

People over the age of 55 reported in significantly higher percentage than the younger, that climate change, obesity ( $p < 0.001$ ), smoking, and epidemics ( $p < 0.05$ ) are hazardous for their health, while those aged 45-54 years considered genetically modified food and chemical residues in food as hazardous for their health in higher percentage ( $p \leq 0.001$ ). Participants over 55 years old believed more than the younger in the ability of the state and public health services ( $p < 0.001$ ) and themselves ( $p < 0.05$ ) to face health risks ( $p < 0.001$ ). They also reported that they trusted more than younger ( $p < 0.05$ ) the way by which mass media present health risks, while those aged between 45-54 years reported in higher

percentage than the rest that mass media serve specific interests ( $p < 0.001$ ).

Chemical residues in food and environmental pollution were considered as dangerous for health by freelancers/agricultural workers/company owners more than the rest of occupational categories ( $p < 0.01$ ), while the employees of the public sector rated obesity as potentially harmful to health and those of the civil (private?) sector rated passive smoking as health hazardous in higher percentage than the other occupational categories ( $p < 0.001$ ). Agricultural workers/owners of companies reported in high percentage that they can face health risks by themselves ( $p < 0.001$ ).

Participants coming from geographical areas other than the two largest metropolitan regions of the country reported in higher percentage than the rest that passive smoking ( $p < 0.001$ ) and obesity ( $p < 0.05$ ) are health hazardous, while respondents from the two largest metropolitan regions considered as potentially harmful to health epidemics and chemical residues in food, respectively, in higher percentage than those coming from the rest of the regions ( $p < 0.001$  and  $p < 0.05$ , respectively). In the second largest metropolitan region (i.e. Central Macedonia), participants reported, in higher percentage, that they trust state and public health services to control health hazards and themselves to face health risks than those living in the other regions ( $p < 0.05$  and  $p < 0.001$ , respectively), while, participants in the largest metropolitan region (i.e. Attica), reported more than the other that private sector is able to face efficiently health risks ( $p < 0.001$ ). Participants coming from the largest metropolitan region, also, reported in higher percentage that mass media contribute to the provision of health information, ensuring, at the same time, the protection of public health ( $p < 0.01$ ).

**Table 1. Distribution (%) of perceived hazard, ability to face and presentation of health risks by socio-demographic indicators (i.e. gender, age, occupation).**

	Total	Gender			Age (years old)					Occupation						
		Male	Female	Sig.	18-34	35-44	45-54	55+	Sig.	Public sector worker	Private sector worker	Freelancer/ Agricultural worker/ Company owner	Retired	Unemployed	Student/ Housewife/ Other	Sig.
	(n=1227)	(n=687)	(n=540)		(n=147)	(n=426)	(n=393)	(n=258)		(n=225)	(n=408)	(n=246)	(n=144)	(n=123)	(n=63)	
<b>Perceived hazard to personal health of each health risk <sup>a)</sup></b>																
Climate change	62.6	60.4	65.5	0.064	51.1	64.8	58.6	70.9	<0.001	64.0	61.9	58.5	64.6	65.0	70.0	0.558
Exposure to sun	76.8	75.3	78.8	0.158	70.8	79.6	75.2	77.9	0.141	78.7	77.6	78.0	79.2	65.9	81.0	0.070
Mobile phone antennas	69.5	67.6	72.0	0.097	68.9	70.4	68.8	69.0	0.957	72.0	65.4	71.6	72.3	70.0	68.4	0.431
Smoking	91.8	93.8	89.4	0.006	91.3	90.0	90.8	96.5	0.019	91.9	93.9	92.7	95.8	87.8	76.2	<0.001
Passive smoking	82.4	82.2	82.6	0.870	77.1	85.0	81.3	82.6	0.164	75.7	89.4	80.5	85.4	75.6	76.2	<0.001
Genetically modified food	82.4	81.5	83.6	0.349	68.2	83.8	86.8	80.7	<0.001	75.3	82.3	78.8	91.5	92.1	85.0	<0.001
Chemical residues in food	95.8	95.2	96.6	0.196	89.6	96.5	96.9	96.5	0.001	92.0	97.0	100.0	95.8	95.1	90.5	<0.001
Obesity	61.7	67.0	55.1	<0.001	58.3	54.6	62.8	73.3	<0.001	72.0	57.9	59.8	70.8	51.2	52.4	<0.001
Epidemics	87.4	85.9	89.4	0.069	80.9	86.6	87.7	91.9	0.015	86.5	88.9	85.4	93.8	90.2	71.4	<0.001
Environmental pollution	98.0	97.3	98.9	0.054	95.8	98.6	98.5	97.7	0.187	95.9	99.3	100.0	97.9	97.6	95.2	0.004
<b>Perceptions about the ability to face and control health risks <sup>b)</sup></b>																
The Greek state and public health facilities can control health risks	19.7	25.4	12.4	<0.001	14.3	15.6	19.4	30.2	<0.001	17.6	17.8	24.4	27.1	9.8	25.0	0.002
The Greek state and public health facilities are ready to face health risks	18.1	23.5	11.3	<0.001	16.3	12.8	19.5	26.2	<0.001	13.5	17.2	22.0	23.9	12.2	25.0	0.017
The private health sector can face health risks	38.7	38.8	38.5	0.907	37.0	38.6	36.2	42.9	0.392	27.4	45.4	43.8	48.9	22.0	38.1	<0.001
Personally, I can face the risks that threaten my health	56.8	58.2	54.8	0.253	59.1	51.2	57.8	62.2	0.042	57.6	54.5	68.9	61.7	41.0	47.1	<0.001
<b>Perceptions about the presentation of health risks <sup>c)</sup></b>																
Experts present the health risks in a valid and reliable way	50.4	49.8	51.2	0.631	44.7	50.0	51.6	51.8	0.519	59.5	40.9	55.0	64.6	36.8	62.5	<0.001
The presentation of health risks by the mass media																
Is valid and reliable	34.0	31.4	37.4	0.031	33.3	36.2	26.9	42.2	0.001	40.0	28.2	35.4	52.2	20.0	35.0	<0.001
Has a tone of exaggeration	88.9	90.6	86.8	0.036	91.7	87.6	89.8	88.1	0.504	87.7	90.1	90.0	87.5	92.5	76.2	0.021
Serves specific interests	91.8	93.2	89.9	0.046	87.0	89.6	95.2	92.9	0.005	90.0	93.0	93.5	93.8	90.2	78.9	0.007
Contributes to the information and protection of public health	40.1	34.7	47.1	<0.001	38.8	45.1	34.6	41.7	0.026	45.9	35.7	42.0	51.1	25.0	44.4	<0.001

Notes: Percentages refer to response categories a) extremely /quite hazardous, b) agree/probably agree, c) yes/probably yes.

**Table 2. Distribution (%) of perceived hazard, ability to face and presentation of health risks by socio-demographic indicators (i.e. geographical area, marital status, health insurance, perceived household welfare).**

	Geographical area				Marital status			Health Insurance				Perceived household welfare			
	Total	First largest metropolitan region	Second largest metropolitan region	Other	Sig.	Married	Unmarried/Divorced	Sig.	EOPYY <sup>a</sup> only	Private	None	Sig.	None/Few difficulties	Many difficulties	Sig.
	(n=1227)	(n=723)	(n=171)	(n=333)		(n=885)	(n=324)		(n=738)	(n=369)	(n=99)		(n=534)	(n=690)	
<b>Perceived hazard to personal health of each health risk<sup>a)</sup></b>															
Climate change	62.6	63.9	58.9	61.8	0.463	66.2	53.8	<0.001	66.3	59.0	51.5	0.003	58.0	66.5	0.002
Exposure to sun	76.8	79.1	73.7	73.6	0.087	79.3	70.8	0.002	78.0	74.6	78.8	0.415	74.6	78.9	0.072
Mobile phone antennas	69.5	68.2	69.1	72.5	0.382	70.2	67.9	0.442	72.9	63.9	65.6	0.007	59.2	77.3	<0.001
Smoking	91.8	92.4	87.3	92.7	0.072	91.5	92.4	0.614	93.0	89.3	90.6	0.109	89.6	93.4	0.016
Passive smoking	82.4	81.8	73.7	88.2	<0.001	82.6	81.9	0.783	84.8	81.1	65.6	<0.001	78.2	85.5	0.001
Genetically modified food	82.4	82.8	77.4	84.3	0.163	83.6	79.2	0.082	87.2	75.8	75.8	<0.001	73.1	89.6	<0.001
Chemical residues in food	95.8	96.2	98.2	93.6	0.034	96.3	94.4	0.155	96.7	95.9	87.9	<0.001	93.2	97.8	<0.001
Obesity	61.7	58.4	64.9	67.3	0.015	60.9	65.1	0.185	66.9	55.7	46.9	<0.001	60.2	63.2	0.298
Epidemics	87.4	89.2	78.9	88.1	0.001	87.1	87.9	0.721	90.6	82.9	78.8	<0.001	81.8	91.7	<0.001
Environmental pollution	98.0	97.9	100.0	97.3	0.111	98.3	97.2	0.226	98.8	97.6	93.9	0.004	97.2	98.7	0.057
<b>Perceptions about the ability to face and control health risks<sup>b)</sup></b>															
The Greek state and public health facilities can control health risks	19.7	21.3	23.2	14.4	0.015	19.9	19.4	0.872	19.7	22.8	9.4	0.013	27.3	14.0	<0.001
The Greek state and public health facilities are ready to face health risks	18.1	18.1	19.6	17.3	0.810	16.6	22.2	0.025	17.8	20.5	12.5	0.176	24.6	13.2	<0.001
The private health sector can face health risks	38.7	43.6	27.8	33.3	<0.001	38.7	39.0	0.908	34.9	47.9	31.3	<0.001	48.0	31.9	<0.001
Personally, I can face the risks that threaten my health	56.8	58.0	64.7	50.0	0.007	56.8	57.1	0.911	52.1	65.2	62.1	<0.001	74.7	43.1	<0.001
<b>Perceptions about the presentation of health risks<sup>c)</sup></b>															
Experts present the health risks that in a valid and reliable way	50.4	53.7	46.4	45.4	0.025	50.5	51.9	0.674	51.1	50.4	50.0	0.970	57.1	45.5	<0.001
The presentation of health risks by the mass media															
Is valid and reliable	34.0	34.2	30.9	35.1	0.636	34.8	31.7	0.322	35.3	32.8	24.2	0.086	34.9	33.5	0.612
Has a tone of exaggeration	88.9	88.4	89.3	90.0	0.728	89.9	87.7	0.278	89.5	86.8	93.8	0.118	90.2	88.3	0.298
Serves specific interests	91.8	90.3	90.9	95.3	0.024	92.5	90.3	0.217	91.5	91.5	100.0	0.016	89.8	93.7	0.014
Contributes to the information and protection of public health	40.1	43.5	40.0	33.0	0.006	41.5	36.8	0.145	42.6	36.4	35.5	0.095	43.8	37.5	0.029

Notes: Percentages refer to response categories a) extremely /quite hazardous, b) agree/probably agree, c) yes/probably yes.

**Table 3. Logistic regression analysis for positive perception towards presentation of health risks by mass media<sup>a)</sup> (N=1170).**

	OR <sup>b)</sup>	95% C.I. <sup>c)</sup>		Sig.
		Lower	Upper	
Exposure to sun <sup>d)</sup>	2.1	1.2	3.5	0.007
Epidemics <sup>d)</sup>	3.0	1.5	6.3	0.003
Genetically modified food <sup>e)</sup>	2.5	1.6	3.9	<0.001

Notes: a) ref. cat.=no/probably no; b) OR=Odds ratio; c) C.I.=confidence interval; d) extremely /quite hazardous vs. not that hazardous/not at all hazardous; e) not that hazardous/not at all hazardous vs. extremely /quite hazardous.

**Table 4. Logistic regression analysis for positive perception towards the ability of Greek state to face and control health risks<sup>a)</sup> (N=1176).**

	OR <sup>b)</sup>	95% C.I. <sup>c)</sup>		Sig.
		Lower	Upper	
Passive smoking <sup>d)</sup>	2.3	1.4	3.8	0.001
Climate change <sup>e)</sup>	1.7	1.2	2.4	0.003
Mobile phone antennas <sup>e)</sup>	2.8	2.0	4.0	<0.001

Notes: a) ref. cat.= disagree/probably disagree; b) OR=Odds ratio; c) C.I.=confidence interval; d) extremely /quite hazardous vs. not that hazardous/not at all hazardous; e) not that hazardous/not at all hazardous vs. extremely /quite hazardous.

Married participants considered climate change and exposure to sunrays as health hazardous ( $p < 0.001$  and  $p < 0.01$ , respectively), more than unmarried/divorced respondents. Participants, who had only public health insurance (EOPYY) considered all risks as health hazardous more than those having private or no health insurance, apart from exposure to sunrays and smoking. People, who lived in households facing financial difficulties, rated all risks – except for exposure to sunrays and obesity – as health hazardous, in higher percentage than those facing few or no financial difficulties.

Participants, who positively perceived mass media (12.0%) were more likely to consider exposure to sunrays (OR=2.1, 95% C.I.=(1.2, 3.5),  $p=0.007$ ) and epidemics (OR=3.0, 95% C.I.=(1.5, 6.3),  $p=0.003$ ) as health hazardous, and genetically modified food as moderately hazardous for health (OR=2.5, 95% C.I.=(1.5, 6.3),  $p < 0.001$ ) compared to those, who haven't adopted a positive view towards mass media. Participants, who reported that they trust the Greek state and public health services concerning to their ability to face and control health risks (16.5%) were more likely to consider passive smoking as potentially harmful to health (OR=2.3, 95% C.I.=(1.4, 3.8),  $p=0.001$ ), whereas climate change (OR=1.7, 95% C.I.=(1.2, 2.4),  $p=0.003$ ) and mobile phone antennas (OR=2.8, 95% C.I.=(2.0, 4.0),  $p < 0.001$ ) were considered by them as moderately hazardous.

## DISCUSSION

The results indicated that more than 90% of the respondents of our sample considered environmental pollution, chemical residues in food and smoking as the top three hazards for individual health, whereas obesity was deemed hazardous by the smallest part of the participants. Public distrust towards the emissions coming from petrochemical industries constitutes a risk perceived especially by the individuals living in

neighbouring areas. This risk can cause elevated anxiety levels and physiological stress to them, although present data need further investigation in order to confirm the effect of air pollution on psychological distress,<sup>(34)</sup> since there is low social trust towards this specific risk.<sup>(35)</sup> Regarding chemical residues in food, in order to develop and implement effective policies on food safety and risk communication strategies, it has been suggested the need for a better understanding of the consumers' perception of nutritional health risks, as well as for relevant preventive actions.<sup>(36)</sup> Regarding the low public perception of obesity as a hazardous health risk in the present study, researchers elsewhere<sup>(37)</sup> reported a similar behavioral pattern in the responses of parents, who, although had previously admitted that their child is obese; they did not perceive obesity as a health risk.

From the findings presented here, it was clear that health risk perceptions differentiated in relation to socio-demographic indicators, a finding, which can be confirmed by previously conducted research.<sup>(38)</sup> For example, smoking appears to be a risk factor that was deemed as less hazardous by the unemployed, students, and housewives, compared to the rest of the occupational categories. The dissemination of this information could help drawing more attention towards the direction for the improvement of the social environment, so as the health and well-being of the disadvantaged to be enhanced.<sup>(38)</sup>

Regarding environmental pollution, our finding that women seem to consider the specific health risks as more hazardous than men is confirmed by previous findings<sup>(13)</sup> according to which Japanese men expressed less concerns than women about the radiation leak coming from the Fukushima nuclear power plant. A large percentage of older respondents (55+) considered the specific, health risks, which were included in the study as extremely/quite hazardous, compared to the respective percentage of younger respondents (>55). The above finding was the same for the



retired participants, who reported highest rates of considering health risks as hazardous, something which confirms that older adults perceive health risks as more hazardous compared to the younger ones, who seem more 'fearless' of health risks. The last is consistent with previous research coming from the field of the prevention of traffic accidents, which found that young male drivers evaluated possible risky driving situations, as less hazardous than older male drivers did. <sup>(39)</sup>

Less than one in five participants claimed that the state and public health services can face health risks. This finding indicates that the public mistrusts those governmental authorities, which need to be upgraded in order to manage health risks efficiently. On the other hand, almost 2/5 of the respondents agreed that the private sector can face health risks in a more efficient manner, than public sector. Similarly, a previous study on risk perception of nuclear waste, found that mistrust towards politicians, experts and industry was a common ascertainment. <sup>(40,41)</sup> Despite all the above, the majority of respondents (more than 50%) reported that they can manage health risks by themselves. But from where did this attitude come from, since they mistrusted state and public services? One explanation for this could be that they showed confidence in the information on health risks that they receive from experts. But only one in two respondents stated that experts present risks in a valid and reliable way. Another interpretation of the above mentioned phenomenon could be that the respondents trusted the information, which was provided to them by mass media. Not really. According to the findings, more than 3/4 of the respondents reported that mass media present health risks with a tone of exaggeration or serve specific interests. At the same time, less than 40% of the respondents viewed positively the presentation of health risks by mass media. The exaggeration of certain risks by mass media and the omission of others has been adopted as a prevailing notion among scholars, on the basis of the findings of the relevant

scientific literature, <sup>(18,25)</sup> so the results presented here are in line with previous research on this issue. When analysing the content of media coverage and risk reporting, researchers can estimate the length of the article/comment, or the frequency with which certain words appear (e.g. "risk", "alarming", etc.) Moreover, scholars can assess the way by which are interpreted journalistic data or findings; however, there is not a certain set of rules, which has to be followed, as it depends on the researchers or the receivers of the information about which method they decide to use for assessing risk information from mass media. <sup>(18,20)</sup> The current findings indicate that, either the participants misperceived of what constitutes a health risk, or were over-confident believing that they were able to manage personally any potential health risk. Another explanation is that community, family and social networks have a long tradition, in Greece, in helping their members, who are in need of social care in order to manage health risks in a more effective, reliable and valid way compared to other sources that were explored in the current study. To conclude with, we assume that the above unexpected result, regarding the perception of health risk, can be attributed to the local socio-cultural context, a finding, which is confirmed by recent surveys investigating the effect of the cultural background of the individual, among other factors, in the process of risk-information framing. The fact that these additional cultural factors were not included in the questionnaire could be considered as one of the study limitations. Another limitation is that it includes a descriptive analysis, although, in-depth and/or qualitative analyses are essential in order to assess, spherically, public perception of health risks. Studies in the field of risk perception often focus generally on the issue of risk perception of the public, neglecting interpersonal and between group differences in risk perceptions. <sup>(22)</sup> The same pattern of research has been followed in the current study, as fact, which can be considered

as a limitation, although the analyses performed have indicated differences between groups of individuals (such as between age groups, occupational categories, etc.) Last, but not least, according to Slovic, <sup>(24)</sup> there are both wisdom and errors in public perceptions, a socially structured cognitive function, which is deemed expected, since the public often does not receive adequate information about risks; therefore, the flow of information from both experts and the public provides the appropriate feedback on more precise risk communication between both sides.

## CONCLUSION

In the eyes of our sample, the most alarming health risks appear to be environmental pollution, chemical residues in food, and smoking. Other serious health risk factors, such as obesity and climate change, do not seem to worry the same population to such a great extent, while their confidence in the reliability of the informational flow and capacity of the state, public health services, of experts, and mass media on managing health risks is quite low. More attention should be given to the reasons behind the mistrust of the public towards the main sources of health information in order to enhance reliability and effectiveness of the means used to tackle health risks and prevent them. The understanding of the mechanisms which lie underneath risk perception is deemed crucial for efficient risk communication. Further research on the individual and cultural differences of the perception of health risks could contribute to the effective prevention and handling of those threatening the population of our sample. This specific topic hasn't been examined adequately in Greece, thus, future studies could not only contribute significantly to the better understanding of it, but also to the improvement of the quality of the health information, which are disseminated to the public, as well the available strategies of risk communication.

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