Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Public Health 187 (2020) 8–14

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Original Research

Health risk perceptions in the era of the new coronavirus: are the Italian people ready for a novel virus? A cross-sectional study on perceived personal and comparative susceptibility for infectious diseases

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ARTICLE INFO

Article history:
Received 23 March 2020
Received in revised form
5 July 2020
Accepted 26 July 2020
Available online 3 August 2020

Keywords:
Coronavirus
Novel virus
Perceived personal susceptibility
Comparative susceptibility
Sociodemographic variables
Personality

ABSTRACT

Objectives: This study aims to evaluate the impact of psychological and sociodemographic variables on perceived personal and comparative susceptibility to diseases caused by a novel, unknown virus.
Study design: Cross-sectional study.
Methods: A total of 438 adults (200 male and 238 female) were interviewed in the waiting rooms of three primary care medicine outpatient clinics. The participants completed three validated questionnaires: the Italian Adjustment of Risk Perception of Infectious Diseases questionnaire, the General Self-Efficacy (GSE) scale, and the Italian Version of Personality Inventory (ITAPI).
Results: Only 5% of the respondents believed it likely that they would contract a disease caused by a novel virus in the following months, even though 5.9% considered this probability higher than that of other people of the same age and gender. Gender ($P < .04$), age ($P = .002$), and marital status ($P = .002$) significantly affected the perceived risk of getting a disease caused by a novel virus. Self-efficacy ($P < .001$), imagination ($P < .001$), and empathy ($P < .001$) were significant predictors of perceived personal susceptibility. Self-efficacy ($P = .04$) and imagination ($P = .04$) were predictive of perceived comparative susceptibility.
Conclusions: Adequate psycho-educational interventions are necessary to empower the population in adopting the necessary prevention and containment measures aimed at limiting the spread of novel diseases such as COVID-19 and avoiding disastrous consequences both at the health and economic level.

Introduction

Risk perception related to health is a subjective judgment that people make about dangers affecting their personal well-being.[1,2] Such judgments dictate precautionary actions[3–5] and influence the probability of complying with health-related recommendations.[6] One main component of risk perception is the concept of 'susceptibility', which concerns how individuals rate their likelihood of contracting a specific disease.[7] Perceived susceptibility, also called perceived vulnerability, includes two dimensions: personal perceived susceptibility, which is the probability that one will be harmed by a hazard, and comparative perceived susceptibility, which is the perceived probability that one is more susceptible to a given danger compared with other people of the same age and gender.[8]

The successful adoption of preventive behaviors to control the spread of diseases largely depends on perceived susceptibility. Although people are often aware of the importance of adopting adequate behaviors to ensure good health for themselves and for others, several subjective variables, such as self-efficacy, personality, and sociodemographic variables, influence the perception and effective adoption of preventive measures.[9] The contribution of subjective variables in determining risk perception is of extreme importance when planning preventive campaigns or in situations that require adherence to specific behavioral models.[10]

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https://doi.org/10.1016/j.puhe.2020.07.036
0033-3506/

'Self-efficacy' refers to the confidence that people have in their personal ability to adopt preventive behavioral measures.[11] It is influenced by culture[12] and affects clinical practice and behavioral change,[13] contributing to predicting practices in health behaviors.[14] 'Personality' traits[15,16] refer to those elements that underlie our individual cognitive, emotional, and behavioral differences.[16,17] Personality traits can help predict individual responses to diseases, health behaviors, mortality risks, and perceived vulnerability to diseases compared with or in association with several sociodemographic variables, such as age and gender.[18,19] Moreover, they are prospectively related to health status in adulthood and influence the adoption of preventive behaviors.[20–22] In this regard, Gaygisiz et al. found that personality traits heavily influenced behavioral responses to the flu during the 2009 pandemic.[23]

The spread of the novel coronavirus, which has caused many deaths in China and around the world, makes the investigation of perceived susceptibility a pertinent concern. Realistic perceptions of disease probability significantly influence the adoption of preventive measures and optimize the possibility of maintaining good health and avoiding the spread of infectious diseases. The novel coronavirus, now called SARS-CoV-2 (severe acute respiratory syndrome coronavirus 2), is the causative agent for COVID-19 outbreak, a new acute respiratory syndrome affecting mostly people in China with some outbreaks in other countries.[24,25] The new virus, isolated for the first time in Wuhan in China in December 2019, quickly spread to other parts of China, and subsequently throughout Asia, Europe, the Americas, and Africa. COVID-19 has not been previously identified in humans.[26] International health organizations, including the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC), placed great emphasis on understanding its spread. On January 30, 2020, the WHO declared a Public Health Emergency of International Concern (PHEIC); some days after, several countries, including Italy, declared national health emergencies.[27]

Vaccines are commonly considered to be the most effective means of mitigating the social and health effects of viral diseases. However, the development of new vaccines takes time. For this reason, the spread of new pathogens typically presages the development of effective vaccines; the only effective response in the interim is prevention. The European Centre for Disease Prevention and Control (ECDC) highlighted that the impact of late detection of an imported case of the novel coronavirus in a European country without the application of appropriate infection prevention and control measures would have been high; therefore, in such a scenario, the risk of secondary transmission in a community setting was estimated to be very high.[28] Unfortunately, this prediction was amply confirmed by the recent outbreak of the COVID-19 epidemic in Italy. Indeed, on February 21, 2020, Patient 1 with COVID-19 was identified in a hospital in Codogno, a county in northern Italy. Starting from the identification of this first ascertained case, the epidemic spread widely throughout northern Italy, forcing the Italian government to adopt very severe virus containment measures with a significant limitation in the social life of Italians. In accordance with the ECDC forecasts, the COVID-19 epidemic was explained by the failure to adopt adequate virus prevention and control measures, which led to the delayed recognition of imported cases of the disease and the start of a chain of secondary transmission of the virus difficult to contain.[29]

In light of these considerations and the current health and social emergency represented by the growing spread of the novel coronavirus, the present study, conducted in the final months of 2019, aimed to investigate perceived susceptibility for a novel, non-defined hypothetical virus. The main goal was to evaluate the impact of psychological and sociodemographic variables on perceived personal and comparative susceptibility to diseases caused by a novel, unknown virus. These findings are particularly relevant in this emergency period related to the new coronavirus, as they increase available information about how people perceive their susceptibility to infectious diseases and aid in the organization of effective preventive campaigns.

Methods

Participants and procedures

In this study, 438 adults (age ranges 19–69 years; 200 males; 238 females) who were in the waiting rooms of three primary care medicine outpatient clinics in Catania (Italy) filled out a battery of standardized questionnaires under the supervision of three psychologists. All people who visited the clinics during a period of 5 days completed the questionnaire, except for three suffering from serious diseases. A total of 235 participants were in the ambulatory for medical consultation or health-status certification release; the remaining were companions. None of the participants suffered from severe pathologies. This modality of consecutive recruitment, which was used in previous studies,[10,30] depended on interviewing people who did not have serious illnesses but were potentially aware of the characteristics of common infectious diseases. This research conforms to the Helsinki Declaration, outlining the principles for research involving human subjects, and was approved by the Chair of School and Family Psychology, Department of Educational Sciences, University of Catania (Italy). Participants provided informed consent. The research followed the Ethical Code for Italian Psychologists (L. 18.02.1989, n. 56), Italian data privacy laws (DLGS 196/2003), and the Ethical Code for Psychological Research (March 27, 2015) approved by the Italian Psychologists Association. Data were collected in November 2019.

Measures

This cross-sectional study used a battery composed of three measures: the Italian Adjustment of Risk Perception of Infectious Diseases questionnaire,[31] the General Self-Efficacy (GSE) scale,[32] and the Italian Version of Personality Inventory (ITAPI).[33]

The Risk Perception of Infectious Diseases questionnaire comprises 85 items. It investigates individual beliefs on several diseases and has been translated into multiple languages and adjusted for different contexts, including the Italian one.[34,35] In this study, we used the version adapted for the 2009 A/H1N1 pandemic.[10] Participants had to respond to the items of the questionnaire using a four-point Likert-type scale.

The questionnaire measures numerous aspects of risk perception for several diseases (common cold, tuberculosis, 2009 A/H1N1 flu, HIV, avian flu, new viruses, and others) and collects information on gender, age, marital status, size of household, and presence of children under 12 years. The present study investigated the perceived personal and comparative susceptibility only in relation to a novel virus (Cronbach alpha .87).

The GSE (Cronbach's alphas: from .76 to .90 in samples from 23 nations) evaluates self-efficacy. It is a four-point Likert-type scale and consists of 10 items. It supplies a global score from 10 to 40.[32] It has been validated in Italian by Sibilia et al.[36]

The ITAPI (short version) measures eight personality traits ('dynamicity,' 'susceptibility,' 'empathy,' 'conscientiousness,' 'imagination,' 'defensiveness,' and 'introversion') using 28 items. Several psychological characteristics describe each trait. 'Dynamicity' (reliability coefficient: Cronbach's alpha: .86) concerns curiosity, the ease of taking initiatives, and liveliness. Dynamic people are resourceful and innovative. 'Susceptibility' (reliability coefficient: Cronbach's alpha: .86) concerns attitudes toward

discouragement and fear. Susceptible people are often unhappy and change their moods easily. 'Empathy' (reliability coefficient: Cronbach's alpha: .79) includes psychological characteristics related to sociability and sensitivity. This trait facilitates recognition of emotions and sensitivity toward other people. 'Conscientiousness' (reliability coefficient: Cronbach's alpha: .82) involves attitudes that are careful, perseverant, and rational. People with high scores in this trait are meticulous and precise. 'Imagination' (reliability coefficient: Cronbach's alpha: .82) concerns creativity and imagination. 'Defensiveness' (reliability coefficient: Cronbach's alpha: .79) is characterized by mental rigidity, materialism, and suspiciousness. Finally, 'introversion' (reliability coefficient: Cronbach's alpha: .72) includes attitudes of introspection, self-isolation, and emotional control. For each trait, the score ranges were from one to five, where one was 'very low' and five considered 'very high'.[33]

Results

Several statistical analyses using the Statistical Package for the Social Sciences (SPSS) version 25.0 (Armonk, NY: IBM Corp.) and Amos package for Structural Equation Modeling (SEM) were conducted. As a preliminary step, we calculated respondents' perceived probabilities of contracting certain infectious diseases (common cold, HIV, tuberculosis, A/H1N1 flu, avian flu in Italy, and a novel virus developed outside Italy). Descriptive statistics, *t*-test, and ANOVA analyses for perceived personal and comparative susceptibility by age and gender were also calculated.

Based on the primary goal of this study, and to better analyze the impact of sociodemographic and psychological variables on perceived susceptibility to a novel virus, we calculated multiple regression analyses. We also developed two structural equation models, which described the relationships between psychological variables and perceived personal and comparative susceptibility. As a preliminary measure, the participants confirmed that they had heard of diseases that were investigated in the questionnaire and were aware that a 'new virus' is a virus that is not previously observed in humans.

Perceived personal and comparative susceptibility for a novel virus and other infectious diseases

The analysis of the responses on likelihood to contract infectious diseases, which were investigated in the questionnaire showed that only 5% of the respondents believed it likely that they would contract a disease caused by a novel virus in the following months, even though 5.9% considered this probability higher than that of other people of the same age and gender (Table 1).

Interestingly, participants considered the probability of getting a disease linked to a new virus higher than the possibility of contracting the infectious diseases that were taken into consideration in the questionnaire, except for a common cold. This result is worthy of attention. Although the perception of risk was low, the respondents considered it more dangerous to have an unknown disease than a pathology caused by known infectious diseases, such as the A/H1N1 flu, which was diffused during the 2019/2020 seasonal flu. In this regard, the European Regional Office of the WHO, in its Flu News Europe of February 2020, reported that A/H1N1 pdm (2009) flu is more frequent than the other types and that a large percentage of the severe cases of flu were related to this virus.

With the purpose of investigating the presence of differences in perceived susceptibility to infectious diseases by gender and age, ANOVA and *t*-test analyses were calculated. Regarding the age variable, the participants were divided into six groups (first group: <20 years old, $n = 20$); second group: 21–30 years old, $n = 81$; third group: 31–40 years old, $n = 52$; fourth group: 41–50 years old, $n = 94$; fifth group: 51–60 years old, $n = 78$; sixth group: 61 years old and higher, $n = 113$). ANOVA analyses showed significant differences by age in perceived personal and comparative susceptibility for all the investigated diseases, except HIV (Table 2), which all respondents considered a highly unlikely disease. Older people had a higher perceived susceptibility for all diseases examined in the questionnaire except for a common cold. Oddly enough, younger people rated the likelihood of contracting the latter disease higher than older participants did. There were no differences by gender in the perceived susceptibility.

Table 1
Frequencies and percentages of the perceived personal and comparative susceptibility to infectious diseases.

	Perceived personal susceptibility		Comparative susceptibility	
	Frequencies	Percentages	Frequencies	Percentages
Common cold				
No answer	1	.5	3	1.4
Very unlikely	21	9.5	30	13.6
Unlikely	27	12.2	41	18.6
Not likely/not unlikely	85	38.5	77	34.8
Likely	87	39.4	70	31.7
HIV				
No answer	5	2.3	7	3.2
Very unlikely	186	84.2	178	80.5
Unlikely	18	8.1	22	10.0
Not likely/not unlikely	9	4.1	8	3.6
Likely	3	1.4	6	2.7
Avian flu outside Italy				
No answer	4	1.8	5	2.3
Very unlikely	129	58.4	136	61.5
Unlikely	54	24.4	51	23.1
Not likely/not unlikely	28	12.7	23	10.4
Likely	6	2.7	6	2.7
Avian flu in Italy				
No answer	5	2.3	5	2.3
Very unlikely	130	58.8	71	32.1
Unlikely	60	27.1	94	42.5
Not likely/not unlikely	20	9.0	42	19.0
Likely	6	2.7	9	4.1
Tuberculosis				
No answer	3	1.4	5	2.3
Very unlikely	73	33.0	122	55.2
Unlikely	91	41.2	64	29.0
Not likely/not unlikely	51	23.1	23	10.4
Likely	3	1.4	7	3.2
Influenza A/H1N1				
No answer	3	1.4	3	1.4
Very unlikely	58	26.2	53	24.0
Unlikely	82	37.1	83	37.6
Not likely/not unlikely	71	32.1	69	31.2
Likely	7	3.2	13	5.9
New virus				
No answer	5	2.3	2	.9
Very unlikely	45	20.4	46	20.8
Unlikely	82	37.1	79	35.7
Not likely/not unlikely	78	35.3	81	36.7
Likely	11	5.0	13	5.9

Table 2
Descriptive analyses and ANOVA values of the perceived susceptibility by age.

	Age in years	Perceived personal susceptibility			Perceived comparative susceptibility		
		M	*SD*	*F*	*M*	*SD*	*F*
Common cold	<20	3.60	.68	6.89**	3.20	1.00	2.93*
	21–30	3.22	.93		3.05	.96	
	31–40	3.27	.86		2.77	1.13	
	41–50	2.65	1.18		2.52	1.28	
	51–60	2.95	.93		2.79	.94	
	>60	3.21	.74		2.88	.94	
HIV	<20	1.40	.82	1.35	1.20	.61	.97
	21–30	1.10	.37		1.10	.48	
	31–40	1.12	.32		1.27	.66	
	41–50	1.15	.64		1.27	.84	
	51–60	1.26	.67		1.31	.88	
	>60	1.21	.67		1.19	.51	
Avian flu far from Italy	<20	2.00	.91	2.77*	1.60	.94	3.06*
	21–30	1.59	.70		1.22	.52	
	31–40	1.62	.88		1.31	.67	
	41–50	1.46	.79		1.63	.97	
	51–60	1.36	.73		1.67	.89	
	>60	1.67	.94		1.82	.77	
Avian flu in Italy	<20	2.20	.76	10.75**	2.40	.82	3.95*
	21–30	1.93	.75		2.02	.87	
	31–40	1.65	.68		2.04	.90	
	41–50	1.58	.76		2.06	1.03	
	51–60	1.79	.79		2.05	.93	
	>60	2.28	.81		2.44	.72	
Tuberculosis	<20	1.70	.92	9.80**	2.40	.94	6.82**
	21–30	1.17	.37		2.10	.88	
	31–40	1.31	.67		2.15	.91	
	41–50	1.42	.79		2.15	1.02	
	51–60	1.54	.81		2.21	.79	
	>60	1.88	.90		2.53	.73	
Influenza A/H1N1	<20	2.20	1.19	3.06*	2.40	.821	3.55*
	21–30	2.02	.81		2.02	.875	
	31–40	2.04	.71		2.04	.907	
	41–50	1.94	.88		2.06	1.034	
	51–60	2.00	.82		2.05		
	>60	2.35	.89		2.44		
Novel virus	<20	2.70	1.12	8.41**	2.40	.940	3.34*
	21–30	2.12	.83		2.10	.883	
	31–40	2.23	.80		2.15	.916	
	41–50	1.79	.89		2.15	1.026	
	51–60	2.23	.83		2.21	.795	
	>60	2.49	.84		2.53	.731	

Note: * sig: $P < .05$; **sig: $P < 001$.

Impact of sociodemographic and psychological variables on perceived susceptibility to a novel virus

Several multiple regression analyses were calculated to investigate the impact of sociodemographic and psychological variables on perceived susceptibility to a novel virus. First, gender, age, marital status, size of the household, and the presence of children under 12 years old were regressed on the perceived personal and comparative susceptibility scores. Second, two regression analyses using personality traits and self-efficacy as the independent variables and perceived personal and comparative susceptibility as the dependent variables were calculated.

The choice to examine the impact of marital status, size of household, and the presence of children under 12 years old depended on the scientific evidence that the size of the household and the presence of children in the family increases the risk of infection for several diseases, such as flu, in which transmission from children to adults in a household is frequent.[10,37,38] Results showed that several sociodemographic variables affected the perceived risk of getting a disease caused by a novel virus. Regarding perceived personal susceptibility (F = 3.40, sig.: $P < .005$; *R* square = . 038), the Std β and *t* values showed the significant contribution to the model of the following predictors: gender ($t = 2.03$, sig: $P < .04$, Std $\beta = .098$), age ($t = 3.18$, sig: $P = .002$, Std $\beta = .19$), and marital status ($t = 3.17$, sig: $P = .002$, Std $\beta = -.18$). According to these data, being women, older, and married is associated with a higher perceived risk of getting a disease caused by a novel virus while being men, younger in age, and unmarried is associated with a lower perceived risk.

Table 3 presents the significant results of the regression analyses and shows the contribution of each predictor to the dependent variable. The sociodemographic variables were not predictive of perceived comparative susceptibility.

The regression analyses, using personality traits and self-efficacy as the independent variables and perceived personal and comparative susceptibility as the dependent variables, showed that psychological variables significantly affected perceived personal susceptibility ($F = 6.26$, sig: $P < .001$, *R* square = .08) and comparative susceptibility (*F*: 2.58; sig: $P = .01$).

In particular, self-efficacy ($t = -4.15$, sig: $P < .001$, Std $\beta = -.23$), imagination ($t = -3.90$, sig: $P < .001$, Std $\beta = .23$), and empathy ($t = 4.53$, sig: $P < .001$ Std $\beta = .23$) were significant predictors of perceived personal susceptibility. Self-efficacy ($t = -1.98$, sig: $P = .04$, Std $\beta = -.11$), and imagination ($t = -2.00$, sig: $P = .04$ Std $\beta = -.12$) were predictive of perceived comparative susceptibility. Table 3 presents the significant results of the regression analyses and shows the contribution of each predictor to the dependent variables.

To better describe the relationships between the psychological variables that influence perceived susceptibility and their relationships, two structural equation models were developed. The models included the three variables that were found to be significant predictors in the regression analyses. The non-significant Chi-square (Chi-square = .001; df = 1; Chi-q/df:.001) and the other FIT model values (RMSEA = . .06; SRMR = .07; CFI = .9) indicated a good fit. The results of the SEM analyses are shown in Fig. 1.

Discussion

The results of the present study showed the impact of sociodemographic and psychological variables on perceived susceptibility. Interestingly, the influence of subjective factors on risk perception for health is relevant, even if the perceived risk concerns

Table 3
Multiple regression analyses of possible predictors for perceived personal and comparative susceptibility in study group.

Perceived personal susceptibility	$F = 3.400$; sig.: $P = .005$; *R* square. .038		
	Std β	*t*	*Sig*
Gender	.098	2.03	.04
Age	.19	3.18	.002
Marital status	−.18	3.17	.002
Perceived personal susceptibility	$F = 6.26$; sig.:$P = .001$; *R* square. .08		
	Std β	*t*	*Sig*
Self-efficacy	−.23	−4.15	<.001
Imagination	.22	−3.90	<.001
Empathy	.24	4.53	<.001
Perceived comparative susceptibility	$F = 2.58$. sig: $P = .02$. *R* square = .11		
Self-efficacy	−.11	−1.98	.04
Imagination	−.12	−2.00	.04

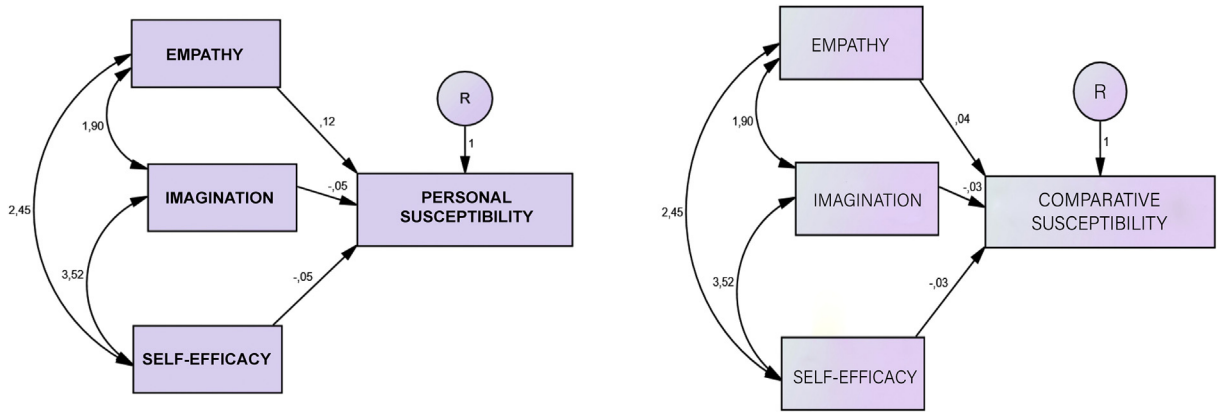

Fig. 1. Structural equation model of empathy, imagination, self-efficacy, and personal and comparative susceptibility.

a non-specific pathology, such as a hypothetical disease related to an unknown virus.

From a public health perspective, these data are particularly interesting because when a novel virus with pandemic potential emerges, such as SARS-CoV-2 responsible for the actual COVID-19 outbreak, 'community mitigation strategies' can help slow transmission of the virus in communities. The community mitigation strategy is a set of non-pharmaceutical actions primarily focused on implementing actions to protect persons at increased risk of severe illness. These actions involve individuals, communities, businesses, and healthcare organizations to help slow the spread of the virus infection especially before a vaccine or drug becomes available.

In the case of SARS-CoV-2, the more vulnerable persons are the elderly and individuals of any age with underlying medical conditions that may increase the risk of serious COVID-19 disease. Accordingly to the CDC/COVID-19 recommendations[39] appropriate actions are based on the following: (i) emphasizing individual responsibility for implementing recommended personal-level actions; (ii) empowering community organizations (e.g. schools, companies, etc.), to implement recommended actions to protect populations most vulnerable to severe illness; and (iii) focusing on settings that provide critical services to individuals at increased risk of severe illness.

Our study clearly shows that interviewed people considered themselves at a lower risk of catching a familiar virus than a novel one, despite the fact that some of these common infectious diseases, such as the flu, are known throughout the population. These data are at the moment particularly useful for planning and implementing public health control activities against COVID-19 outbreak, because people ought to strictly follow the recommended prevention strategies, such as avoiding exposure by adhering to recommended hygiene procedures (e.g. handwashing, mouth and nose covering when coughing and sneezing, daily cleaning, and disinfecting touched surfaces, etc.), isolation of SARS-CoV-2-infected persons and social distancing.

The older respondents of our sample perceived themselves at higher risk of getting a disease related to a novel virus compared with the younger respondents. These data are particularly important for two main reasons, at least. First of all because, as already underlined, elderly people are at the increased risk of serious COVID-19. Therefore, a high-risk perception could mean that older people are most likely to adopt protective behaviors. On the other hand, children are less likely to become infected or their symptoms are so mild that their infection could escape detection, which has important epidemiological implications.[40] For this reason, the implementation of behavioral strategies appropriate for the young is necessary to protect the elderly. Self-control strategies for behavioral interventions could help young people in learning the skills necessary to practice and implement behavioral changes, adopt prevention measures or eventually correct mistakes. In particular, young people may require external support persons (e.g. parents, teachers, or behavioral analysts) when learning the established prevention measures for reducing COVID-19 or other communicable diseases transmission in the population through the correct application of personal protective measures. These measures refer to hand and respiratory hygiene, cough etiquette, and use of face masks in the community, as recommended by the ECDC.[41] The external supports should provide modeling of skills for the young to watch, encouraging them to practice, and correcting mistakes. Obviously, adults will model the appropriate behaviors themselves in the same contexts where young people will be expected to exhibit those skills (schools, shopping centers, public parks, etc.). As young people learn how to perform skills and when and where to perform them, they should learn to self-monitor their own behavior in appropriate contexts.[42]

The multiple regression analyses and SEM contributed to better investigating the impact of sociodemographic and psychological variables on perceived risks of health. The findings showed that gender, age, and marital status influenced the perceived personal probability of getting a disease caused by a novel virus. Psychological variables also have a high impact on perceived risk for health. This result is worthy of attention, pending planning effective prevention campaigns that reach a large part of the population. People with different personality characteristics present a different level of risk perception for their health. The levels of empathy, self-efficacy, and imagination significantly influenced perceived susceptibility, presumably contributing to the adoption of preventive behaviors in situations of need. These issues clarify the results of previous studies that found that several personality aspects affect the perception of being at risk and the consequent engaging in health-protective behaviors.[43–46] Interestingly, 'self-efficacy' and 'imagination' were found to be the significant predictors of risk perception, as reported in the previous studies about this topic.[10] To confirm these data, the recent literature on the topic showed that these psychological variables have a significant role in promoting effective prevention campaigns. More specifically, preventive self-efficacy, defined as the perception that an individual has of their own ability to adopt specific healthy behaviors, is an important variable in promoting adherence to preventive measures and healthy behaviors such as quitting smoking or exercising more.[47] Furthermore, it has also been shown that empathic messages that stimulate self-efficacy are helpful in promoting disease

prevention.[47] Indeed, empathy enhances persuasion of health communication campaigns by fostering a better cognitive and emotional understanding of the personal relevance of the risk.[48] Finally, other studies confirmed that imagination can influence the reporting of healthy behaviors.[49]

This study has some limitations. First of all, it is based on data from a single center, and it would be interesting to conduct similar studies in other geographic areas to evaluate any differences in risk perception related to social and cultural differences. Furthermore, we investigated the perceived risk for a hypothetical novel virus, and it would be important to replicate this study in light of the recent outbreak of the COVID-19 epidemic in Italy to verify how much the impact with this new disease may have changed the risk perception of the subjects interviewed.

However, these results are of particular practical interest, given that the recent outbreak of coronavirus in Italy requires that people engage in the proper behavioral measures to mitigate the disease's spread.

Conclusion

In conclusion, our study shows how subjective factors significantly affect the risk perception for health, even in case of non-specific pathology, such as a hypothetical disease related to an unknown virus. In this regard, our results suggest taking into account the role of psychological variables, especially empathy, self-efficacy, and imagination, in promoting effective psycho-educational interventions aimed at empowering the population in adopting the necessary prevention and containment measures.

In light of the current COVID-19 outbreak worldwide, it is therefore important to adopt specific programs to enhance the personality characteristics that play an important role in adopting healthy and preventive behaviors to limit the spread of the virus and avoid disastrous consequences both at health and economic level.

Author statements

Ethical approval

This research conforms to the Helsinki Declaration, outlining the principles for research involving human subjects. Participants provided informed consent. The research followed the Ethical Code for Italian Psychologists (L. 18.02.1989, n. 56), Italian data privacy laws (DLGS 196/2003), and the Ethical Code for Psychological Research (March 27, 2015) approved by the Italian Psychologists Association. The study was approved by the Chair of School and Family Psychology of the Department of Educational Sciences, University of Catania (Italy).

Funding

None declared.

Competing interests

None declared.

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