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COVID-19 Pandemic: opinions and behavior of Italian general population during the first epidemic phase

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Abstract. *Background and aim:* On January 9, 2020, the World Health Organization (WHO) declared that Chinese health authorities had identified a new coronavirus strain never before isolated in humans, the 2019-nCoV later redefined SARS-CoV-2, that still today represent a public health problem. The present survey started on 10 February 2020 with the aim of a) assessing the risk perception in healthcare workers and young students, following the evolution of attitudes, perception and knowledge over time, b) provide useful

information to the general population during survey. *Results:* A study sample consisting of 4116 Italian individuals of both sexes was enrolled. High levels of risk perception, low perception of self-efficacy and low levels of knowledge scores (24.55 ± 5.76 SD) were obtained indicating the need for continuous population monitoring as well as further communication strategies carried out at institution levels. *Conclusion:* The results of the present study could help public health authorities in carrying out informative campaigns for general population and could be an important tool in evaluating public knowledge and misperceptions during the management of the COVID-19. (www.actabiomedica.it)

Key words: COVID-19; risk perception; knowledge; attitude; perception; population

Introduction

Risk perception is defined as "a cognitive process involved in various daily activities that guide people's behavior in the face of decisions involving potential risks" (1). Following this definition, there is a discrepancy between the subjective perception of risk and the objective assessment (2) for which the perceived risk is to be considered as the sum of two factors, the hazard calculated by the experts and the outrage (subjective reaction to the danger) (3); it happens that people could sometimes fear activities that are not actually dangerous and be not afraid, instead, of activities that could have very dramatic consequences.

Research shows that there are some factors that influence people's risk perception, and that the acceptability of the risk is therefore influenced by a series of mitigating and aggravating factors (i.e. voluntary nature of the exposure, personal control, familiarity, severity of consequences, etc . . .) (1–3).

On January 9, 2020, the World Health Organization declared that Chinese health authorities had identified a new coronavirus strain never before isolated in humans: 2019-nCoV (4). The virus was associated with an outbreak of pneumonia cases recorded as of December 31, 2019, in the central China city of Wuhan. As of January 31, based on data published by the European Center for Disease Prevention and Control (ECDC), a total of 11,955 laboratory confirmed cases of 2019-nCoV infection were notified, of which 259 deaths. In Europe, in the EU/EEA (European Union / European Economic Area) countries, there were only 22 confirmed cases (5). On January 31, the first two cases of new coronavirus 2019-nCoV infection in Italy were confirmed by the National department of Health (6). All cases recorded outside of China were at that time associated with travel to the city of Wuhan or had direct contact with people with a history of travel to China.

The new Coronavirus 2019 epidemic outbreak that struck China raised alarm in the general population. Based on the information available at the time, the ECDC risk assessment (7) reported that the potential impact of 2019-nCoV (later renamed severe acute respiratory syndrome – coronavirus – 2 (SARS-CoV-2) outbreaks was high; further global spread of the infection was likely and that the probability of infection for EU / EEA citizens residing in (or visiting) Wuhan was moderate as was the likelihood of observing additional imported cases of 2019-nCoV infection in countries with the highest flows of travelers from Wuhan (i.e. Asian countries). The agency also recalled how adequate infection prevention and control practices adherence would have led to low probability that a case identified in the EU/EEA could follow(7).

Based on these premises due to the contingent pandemic situation, the aim of this study was a) to study levels of perceived threat, risk perception, severity and comparative vulnerability b) to compare risk perception with other communicable/not communicable diseases; c) to provide information in order to increase awareness/ knowledge of the disease in population.

Materials and Methods

A multicenter study was conducted between the 10th of February and the 12th of July 2020, during the first wave of SARS-CoV-2 infection among the general population in Italy, at the Universities of: Bari, Bologna, Cagliari, Catania, Catanzaro, Florence, Foggia, Genoa, L'Aquila, Milano - Statale, Milano - Vita-Salute San Raffaele, Modena e Reggio Emilia, Napoli - Federico II, Napoli Vanvitelli, Palermo, Parma, Roma - Sapienza, Sassari, Siena, Torino, Udine, Verona. The subjects in the study (Both sexes, ≥18 and able to understand the Italian language in the informed consent and in the questionnaire) were enrolled through the administration of a standardized questionnaire. They were enrolled through a random questionnaire both at the universities and through Google forms. The questionnaires were administered through the following techniques: 1. CAPI (Computer Assisted Personal Interview), in which data is collected by an interviewer during a face-to-face meeting with the respondent; 2. CAWI (Computer Assisted Web Interviewing), through email. For the CAWI method technique, the interviews were conducted by staff medical doctors/ physicians and medical residents in Public Health and Preventive Medicine of all the centers enrolled. All participants were informed on the methodology used to ensure confidentiality of data and a written informed consent was obtained according to the Italian privacy law. Interviews were carried out in places allowing adequate privacy levels. For the CAPI method a link was sent by the interviewees to the patients in order to fill in the questionnaire independently.

Sample size

Considering a population of about 10,000,000 people of both sexes in the locations cities which have participated in the multicenter study (including Bari, Bologna, Cagliari, Catania, Catanzaro, Foggia, Florence , L'Aquila, Messina, Milan, Modena, Naples, Palermo, Parma, Rome, Sassari, Siena, Turin, Udine and Verona), with the exception of people <18 , considering an α error of 5% and a confidence level of 95%, the model calculated a sample size of 4000 questionnaires to be administered.

Survey

a. Socio-demographics characteristics of interviewees (gender, age, educational level, work, region of origin). A categorical variable was created to distinguish and compare the responses of healthcare workers, the general population and university students of medical and non-medical areas). A specific item was created based on the European Health Literacy Survey Questionnaire – short form with 6 items (HLS-EU-Q6; Italian version), the short-short version of a 47-item tool used in the first European survey conducted in 2012.
b. perceptions of risk of the interviewees: in particular, we asked how interviewees estimated the risk of contracting the COVID-19 disease and how severe it would be for them, the likelihood of contracting the disease in the absence/ presence of vaccination and in the presence of preventive measures. To compare risk perceptions related to SARS – CoV-2 with other potential threats, respondents were asked to indicate the likelihood to become infected or have other illnesses/ accidents.
c. knowledge of CoVid-19: respondents were asked to tick items they found correct and a score was created for the descriptive analysis; the questions were about awareness of the disease, type of symptom (s) (or pathological condition), whether it is a communicable disease, if it is always symptomatic, if people can die if they get such an infection, if there is a vaccine against 2019 n-CoV infection, and if it can be prevented with good hygiene. Information was requested regarding the recommendations both on the use of the surgical mask by the WHO and on the behaviors to be implemented in the event of suspected COVID 19 infection.
d. self-efficacy (i.e. if the individual felt able to avoid contracting the disease) and the actions that the subject would have taken to avoid it (avoid public transport by bus, plane; avoid going out to have fun, such as in bars, restaurants, theaters, cinemas; limit shopping to the

essentials; do not go to work; do not take children to school (even if school is still open); limit physical contact; avoid seeing doctors , even if not related to the flu when you are sick from something; always stay indoors). Also, the propensity to get a vaccine against various diseases and also, in the future for CoViD-19 was assessed together with the main reasons of refusal.

e. Type of information resources used and trust in them.
f. Perception of physical and mental status.

Finally we provided them with a set of standard WHO recommendations for the general public in order to reduce exposure and transmission of a range of diseases (~~Clean your~~ hands frequently using an alcohol-based cleanser or soap and water; When coughing and sneezing, cover ~~your~~ mouth and nose with your bent elbow or handkerchief - immediately throw away the handkerchief and wash your hands; avoid close contact with anyone with fever and cough; In case of fever, cough and breathing difficulties, consult a doctor immediately and share the history of any previous trip with your doctor; when visiting live animal markets in areas that currently have cases of the novel coronavirus, avoid direct unprotected contact with live animals and surfaces in contact with animals; Consumption of raw or undercooked animal products should be avoided; Raw meat, milk or animal organs must be handled with care, to avoid cross contamination with raw foods, as per good food safety practices). Last two question were about the willingness to receive further information and attend a training meeting on the risk of infection and prevention methods (the telephone numbers of two investigators from the main center were provided). The questionnaire was implemented in the early stages of the epidemic in China and in particular the data was collected starting from 11 February.

Statistical analysis

All the answers in the questionnaire detected in the multicenter study were summarized. In particular, for the qualitative responses (sex, educational qualification, province of residence, type of job, degree attended, presence of minors at home, severity of the disease, probability of contracting Coronavirus without preventive measures, etc.) the summary was performed using the absolute, relative frequency and 95% confidence interval. On the other hand, the quantitative characteristics (age, number of people living in the house, etc.) were summarized by means of mean, median, maximum and minimum values, standard deviation, interquartile interval and 95% confidence limits. To estimate the perceived risk of infectious diseases in the general population, all the possible associations of the data collected (sex, territorial stratifications, type of work, university population, etc.) were made and contingency tables were constructed, testing the hypotheses by means of the square ($\chi 2$). In the presence of tables r x k and only in the hypothesis of rejection of the hypothesis H0, the method of partitioning the degrees of freedom was used (7). In addition, stratified analyzes (gender, place of residence, educational qualification, profession, etc.) were conducted using the Mantel-Haenszel $\chi 2$ test (8). The predetermined level of significance is $\alpha = 0.050$; therefore, p-values <0.05 for two-tailed tests were considered statistically significant. The synthetic and inferential statistical analyzes were performed using the R software (9).

Results

A sample of 4116 individuals (mean age 32.96 12.96 SD) was investigated, of which 35.9% were male (n = 1474; mean age 33.71 ± SD 13.25) and 64.1% female (n = 2637; mean age 32.53 ± SD 12.96). The socio-personal characteristics are summarized in Table 1.

The Educational level of the sample was high with 49.5% of the sample graduates and 1.1% with postgraduate training. Students represented 41.5% of the sample (of these 8.7% are from the non-medical area and 35.1% from the medical area). Health professionals accounted 26% of the interviewees (doctors 14.2%, nurses 4.6%, social and health workers 0.5%, administrative 2.1% and 4.5% other health professions; 74.1% did not provide the data) and 32.5% of the remaining sample was attributable to the general population. The results of European Health Literacy Survey Questionnaire - short form with 6 items. Italian version (HLS-EU-Q6) are presented in Table 2.

Table 1. Sociodemographic characteristics of the sample (education level, where he/she lives, health literacy, etc . . .)

	N	%
Gender Male Female	 1474 2637	 35.9 64.1
Mean age ± SD	32.96 ±12.96 SD	
Area of Origin		
Northern Italy	1361	33.1
Center	397	9.6
Southern Italy	2358	57.3
Employment		
Public employee Private Employee Housewife Other Freelance Student	1088 765 55 71 418 1708	26.4 18.6 1.3 1.7 10.2 41.5
Educational level Less 8 years More 8 years	 94 3955	 2.2 97.1
Live in . . . Suburbs Center	 2048 2068	 49.8 50.2
Live with A Child	583	14.2
Number of people living with the respondent	3.07 ± 1.25 SD	
HEALTH LITERACY	mean score :77.04 ± 17.75 sd median 81 ± 19 IQR	

Perception of the severity of the disease

The perception of risk was therefore investigated through a series of items. Firstly, a question regarding the possibility to contract certain infectious and non-infectious diseases, asking ~~to~~ the respondents to assign a score from 1 to 10, was administered. The elements concerning the perception of severity are mainly aimed at the physical severity of the disease, but also to medical and clinical consequences (i.e. death, pain) and possible psychosocial consequences (i.e. effects on work, family life and social contacts). The results are represented in Tab. 3 and Tab 1s (supplementary file).

Perception of disease susceptibility and degree of anxiety

Subsequently, respondents were asked how likely it was that they would develop or contract certain diseases in the following 12 months compared to other people of their age in Italy (for those infectious only in the absence of preventive measures) compared to the average of (women / men) of their age. The results are shown in the Table 4. The items relating to the perception of susceptibility focus on the individual's chances of contracting the disease during a certain period in the near future, comparing them to susceptibility to other diseases (Table 3 and Table 2s). The possibility of contracting the new coronavirus disease

Table 2. European Health Literacy Survey Questionnaire- short form with 6 items. Italian version **(HLS-EU-Q6). (modified** from Lorini C. et al. FHLRG. Ann Ist Super Sanita. 2019;55(1):10-18.)

	Very hard % (n)	Quite hard % (n)	Quite easy % (n)	Very easy % (n)	I don't know % (n)
1) . . . evaluate when it is necessary to have a second opinion from another doctor?	4 (164)	35 (1440)	46 (1895)	10.5 (433)	4.5 (184)
2) . . . use the information your doctor gives you to make decisions about your disease?	2.6 (109)	17.8 (731)	54.4 (2238)	23.3 (958)	1.9 (79)
8) . . . find information on how to manage mental health problems. such as stress or depression?	12.7 (521)	41.1 (1690)	32.4 (1335)	9.8 (405)	4 (164)
11) . . . evaluate if the information on health risks reported by the media is reliable?	19.3 (793)	39.7(1636)	28.5 (1173)	10.5 (434)	1.9 (80)
13) . . . identify activities that are good for mental well-being?	4.6 (188)	24.6 (1014)	47 (1935)	20.5 (845)	3.3 (134)
15) . . . understand the information reported by the media on how to improve your health?	8 (331)	28.2 (1159)	42.8(1763)	18.2 (749)	2.8 (114)

Table 3. Perception of severity and susceptibility/degree of anxiety of in the presence or absence of preventive measures of the disease

	Perception of the severity of the disease		**Perception of disease susceptibility and degree of anxiety**	
	Average	SD	Average	SD
Diabetes	6.74	2.37	1.87	1.06
Common cold	1.78	1.41	4.07	1.09
HIV	8.53	2.19	1.65	1.00
Hypertension	6.46	2.28	2.16	1.14
SARS-CoV-1	7.58	2.41	1.82	1.02
Tuberculosis	7.82	2.29	1.81	.99
Heart attack	8.53	2.13	2.14	1.09
Novel influenza virus	6.63	2.63	2.93	1.10
Food poisoning	4.74	2.43	2.74	1.08
SARS CoV-2	6.85	2.65	2.96	1.16

Table 4. Perception of efficacy and self-efficacy against infectious diseases and COVID-19 disease (mean and SD).

	Efficacy		**Self-efficacy**	
Novel influenza virus	3.11	0.91	2.22	0.96
SARS-CoV-1	3.25	0.96	2.41	1.14
SARS CoV-2	3.22	0.86	2.23	0.96
Common cold	2.79	1.07	2.41	1.05

in the following 12 months was then investigated in the presence of general preventive measures and vaccination, assigning a score from 1 (very small possibility) to 5 (very large possibility). Only 26.6% of the sample assigned a score lower than or equal to 2 with regard to general preventive measures (table 3s), while the perception of risk dropped enormously in the presence of immunization (3.1% declared a value of 3 or 4).

Perception of risk: effectiveness of the response and self-efficacy

In the next session of questions, the effectiveness of the answer and the self-efficacy of the interviewees were investigated. In particular, they were asked if in general, people could take actions to prevent the onset in the event of an epidemic in Italy for certain diseases (influenza due to a novel virus, SARS-CoV-1, SARS-CoV-2, common cold) and felt able to prevent the same diseases on their own (Tab. 4 and Tab 4s-5s).

Knowledge

The following question session was to investigate the knowledge of the disease in the population (symptoms, mode of infection, probability of death, presence of a vaccine, method of prevention). First of all, the interviewee was asked to indicate the symptom (s) (or pathological condition) of the new Coronavirus infection, selecting all the applicable items including cough, pneumonia, fever, myalgia, flu-like symptoms (Tab 6s). The most reported association of symptoms was "Cough, Pneumonia, Fever, Flu-like Symptoms" from 20.6% of the sample and "Cough, Pneumonia, Fever, Muscle Pain, Flu-like Symptoms" from 18.9%.

General questions were then asked regarding the transmission, mortality and prevention of the COVID-19 disease. In particular, the interviewees are aware that the disease is communicable (99.1%, n = 4078), that it can be asymptomatic (85%, n = 3498), fatal (91.9%, n = 3782). Finally, 89.9% are aware that

to date there are no vaccines for its prevention and that hygiene measures reduce transmission (83%, n = 3418).

It was also asked if the flu can be fatal for individuals getting an affirmative answer from only 89.6% (2884) of the sample, a negative from 6.2% (254) and an indecision from 4.2% (173) of the interviewees.

The known preventive measures were also investigated more specifically, referring to what is reported by the WHO in the Guidelines and in the "Q&A on coronaviruses (COVID-19)". These questions also aim to investigate the perception of general efficacy of self-efficacy. The results are reported in Table 7s and 8s.

The knowledge on the use of the mask was then investigated more specifically as per WHO recommendations.

According to 66.1% of respondents, the WHO recommends wearing a mask in case of suspicion of having contracted the new coronavirus or in the presence of symptoms such as coughing or sneezing. 70.4% indicate the need to use a mask if the individual cares for a person with suspected new coronavirus infection (e.g. recent trip to China and respiratory symptoms). 38.5% would use it in every situation in which they come into contact with other people with flu symptoms, 31.7% in any overcrowded place and 12.2% in every trip outside Italy.

Finally, we asked what actions and behaviors were to be taken in case of suspected acquisition of the new coronavirus infection including contacting the free phone number of the Ministry of Health 1500 (only 88.9% answered affirmatively), wearing a surgical mask if in contact with other people (83.4% answered affirmatively), using disposable handkerchiefs and washing their hands regularly (93.9% replied affirmatively), going to their doctor (24.1% answered affirmatively) and going directly to emergency (17.7% replied affirmatively).

Information sources and the need to receive information

In a first item in this section the amount of information obtained from different sources in the last year on new and emerging diseases with the exclusion of coronavirus (eg Ebola, etc. . . .) and the trust in these sources was investigated. The results are shown in the following tables 5 a and 5 b.

Subsequently, attention was focused on the information received on the COVID-19 disease. Overall,

Table 5. A) Quantity (a) of information obtained and trust (b) for the various sources of information in the last year on new and emerging diseases with the exclusion of coronavirus (eg Ebola, etc . . .); B) amount of information obtained for the different information sources on coronavirus; C) preferred source of information

A	**New and emergent disease**				
Information source	**None % (n)**	**Few % (n)**	**Some % (n)**	**Many % (n)**	**Lots of them % (n)**
Newspaper A	18.1 (743)	29.7 (1222)	27 (1110)	18.3 (754)	6.9 (283)
B	13.2 (542)	29.9 (1229)	39.1 (1611)	13.3 (547)	2 (81)
Television A	10.5 (434)	20.8 (856)	25.8 (1063)	25.7 (1058)	17 (701)
B	13.5 (554)	31.9 (1313)	38.3 (1577)	12.2 (501)	2.7 (110)
Radio A	25.1 (1035)	28.4 (1171)	25.7 (1056)	14.9 (612)	5.8 (237)
B	16.9 (697)	29.9 (1229)	36.4 (1498)	10.5 (433)	1.8 (74)
Web sites A	4.9 (202)	11.7 (480)	24.8 (1022)	33.1(1362)	25.4 (1045)
B	9.5 (389)	27.7 (1139)	44.3 (1822)	13.6 (560)	3.6 (147)
medical practitioner a	48.22 (1984)	25.7 (1057)	16.7 (686)	7 (287)	2.3 (96)

Table 5 (*Continued*)

Table 5. A) Quantity (a) of information obtained and trust (b) for the various sources of information in the last year on new and emerging diseases with the exclusion of coronavirus (eg Ebola, etc . . .); B) amount of information obtained for the different information sources on coronavirus; C) preferred source of information (*Continued*)

A	**New and emergent disease**				
Information source	**None % (n)**	**Few % (n)**	**Some % (n)**	**Many % (n)**	**Lots of them % (n)**
B	12.7 (523)	9.4 (387)	19.6 (807)	34.4 (1417)	16.4 (673)
Government and agencies a b	21.1 (868)	25.3 (1040)	26.5 (1092)	18.7 (769)	8.3 (343)
	9.4 (386)	13.8 (568)	26.3 (1083)	30.2 (1241)	16.5 (679)
Consumer interest group A	45.6 (1875)	26.8 (1103)	18.5 (761)	6.6 (272)	2.4 (100)
B	25.6 (1052)	28.3 (1163)	29.2 (1202)	6.6 (271)	2.2 (89)
Family and friends A	20.2 (832)	27.9 (1149)	28.6 (1179)	16 (660)	7.1 (292)
B	14.6 (601)	29.9 (1231)	36.6 (1505)	11.8 (485)	4.5 (185)
B	Information on coronavirus^				
Newspaper	3.8 (155)	6.3 (259)	11.2 (460)	25 (1030)	50.9 (2095)
Television	1.1 (45)	2 (81)	4.9 (203)	16 (658)	74.9 (3083)
Radio	4.8 (197)	7.4 (303)	15.3(630)	26.5 (1091)	40.1 (1650)
Web sites	0.9 (39)	2 (81)	7 (288)	20 (825)	68.6 (2823)
medical practitioner	28.3 (1165)	17.9 (737)	23.4 (963)	11.6 (479)	9.7 (398)
Government and agencies	4.7 (195)	7.3 (299)	17.8 (731)	28.7 (1181)	39.1(1610)
Consumer interest group	20 (822)	13.6 (561)	17.6 (726)	15.9 (654)	22 (906)
Family and friends	3.6 (147)	7 (289)	16.8 (691)	25.3 (1042)	44.5 (1833)
C	Preferred information source *				
Newspaper	10.3 (424)				
Television	59.7 (2457)				
Radio	4.4 (182)				
Web sites	49.7 (2047)				
medical practitioner	29.8 (1227)				
Government and agencies	55.7 (2292)				
Consumer interest group	1.2 (48)				
Family and friends	7.7 (318)				
Other	1.1 (45)				

^Data relating to the answer "I don't know" is not reported; * respondents could express more preferences

the results show that a lot of information is provided from internet sites (68.6%) and television (74.9%) and none or little from GPs and interest groups. The following section contains questions to highlight the topics respondents want to receive information about, who they want to receive information from and how. In particular, the results show television and internet sites as the desired source (see table 5c). The main information required relates to the methods of prevention (53.7%), followed by that relating to the recognition of the symptoms of the disease (17%) and its mode of transmission (13.7%). (Tab 9s). Finally, the trust placed in the various sources was investigated. There is increased trust in the general practitioner and in government / government agencies. The lower trust was observed for other sources (which included for example social media, other doctors, etc…) and for the interest groups of consumers or patients. Therefore, an increasing trend in trust in the various sources was observed in the first 6 weeks considered, with statistically significant differences (p 0.001) for each of the sources investigated, with an increase over time for the doctor and government agencies (such as ECDC, WHO, etc . . .). (Table 6).

Self protection and vaccination

The next questioning session aimed to investigate where the subject felt least safe, what actions he would take in the event of an ongoing outbreak and whether a vaccine had been made available, whether or not he was vaccinated and if he was not, the underlying reason. Likewise, the propensity towards other vaccinations and the same anti-influenza vaccination was investigated.

Subjects said they had a greater risk on means of transport (55%) and in hospitals (22.4%) and in meeting places (16.6%). The perceived risk with family members or in commercial activities is instead lower (Tab 10 s).

Subjects in the presence of an outbreak of infection in Italy in line with what was previously reported would consequently avoid public transport and physical contact also avoiding the attendance of bars, restaurants and places of aggregation in general. 14.4% would not go to work and a significant figure is that 27% would never leave home (Tab 7).

He/she was therefore asked whether in the event of immediate availability of a vaccine for this disease the subject would be vaccinated, obtaining an affirmative answer from only 76% of the sample an indecision in 17.5%. In case of negative / doubtful answer the reason was asked obtaining qualitative answers similar to three types: lack of trust in the vaccine (7.2%), lack of perception of susceptibility to the disease (3%) or fear of side effects (4.1%). 1.9% gave various reasons attributable to their state of health or lack of confidence in vaccines in general. He/she was then asked whether he would be vaccinated for a number of diseases underlining those vaccines are not available for some (Tab 8). The question about the flu was introduced twice as a confounding factor.

The question relating to the intention to vaccinate for influenza was associated with the question relating to carrying out the same vaccination in the last campaign, obtaining an affirmative response from only 28.2% of the sample. The sample , moreover, provided information relating to the judgment on their health status in the last 4 weeks with a score from 1 to 6 (where 1 is very poor and 6 very good) obtaining an average of 4,910.99 and if speaking about their life in general. they would say they are happy or unhappy with an average of 2.67 0.91. Finally, we asked if he/she would be interested in receiving further information and participating in a training meeting on infectious risk and prevention methods obtaining an affirmative answer in 44.4% of the sample.

Knowledge score analysis

Knowledge of the COVID-19 disease was assessed by assigning a score to the answers given on the WHO recommendations and on the measures to be implemented in case of suspected infection with a maximum score of 44. The score obtained on the entire sample returned an average of 24.55 ± 5.76 SD (median ± IQR = 25 ± 8). The maximum score obtained was 42. The presence of statistical differences

Table 6. Trust in various sources of information and average ±DS (in total and in the first 6 weeks)

Other source ^	Family or friends % (no)	Interest groups cons. % (no)	Government and government agencies	General practitioner	Internet sites	Radio	Television	Newspapers	Information source	
27 (875)	15.6 (504)	22.9 (741)	7.1 (229)	8.1 (263)	11.2 (364)	17.5 (566)	16 (517)	16.3 (527	1 % (n)	
10.7 (347)	16.1 (523)	15.7 (510)	7.5 (244)	5.4 (175)	14.3 (464)	16.2 (526)	16.1 (522)	15.9 (516)	2 % (n)	
9 (292)	14.3 (463)	13.3 (432)	10.7 (346)	10.5 (340)	15.4 (499)	14.9 (483)	15.3 (495)	16 (517)	3 % (n)	
6 (193)	11 (358)	9.7 (314)	9 (292)	8.8 (286)	10.4 (337)	9.3 (302)	9.5 (307)	7. 7(250)	4 % (n)	
10.8 (351)	14 (452)	13 (421)	9.9 (321)	8.8 (285)	14.2 (459)	12.9 (419)	12.1 (393)	12.5 (495)	5 % (n)	
6.8 (221)	10.6 (343)	10.5 (339)	7.8 (252)	7.8 (252)	11.5 (374)	10.3 (335)	9.5 (307)	9.8 (316)	6 % (n)	
4.8 (155)	8.8 (286)	7.7 (250)	10.4 (336)	9.8 (316)	9.2 (299)	9.3 (301)	8.8 (286)	9.8 (318)	7 % (n)	
3.9 (125)	5.3 (171)	4.7 (153)	14 (455)	15.3 (496)	8.5 (275)	5.9 (190)	7.2 (234)	7.9 (257)	8 % (n)	
2.2 (72)	2.5 (80)	1.6 (52)	10.9 (353)	12.8 (416)	3.3 (106)	2.3 (73)	3.2 (105)	2.6 (84)	9 % (n)	
3.6 (118)	1.9 (60)	0.9 (28)	12.7 (412)	12.7 (411)	1.9 (63)	1.4 (45)	2.3 (74)	1.5 (50)	10 % (n)	
3.71±2.70	4.13±2.38	3.76±2.34	5.97±2.84	6.10±2.86	4.49±2.41	4.05±2.40	4.21±2.50	4.19±2.47	total	
1 Media±DS	3.93±2.34	3.56±2.33	5.48±2.81	5.78±2.8	4.16±2.38	3.79±2.29	3.78±2.32	3.86±2.32	1st week	**Average±DS**
2 Media±DS	3.93±2.33	3.79±2.34	5.67±2.84	5.71±2.89	4.24±2.34	3.93±2.37	4.15±2.48	4.15±2.46	2nd week	
3 Media±DS	3.84±2.33	3.47±2.26	5.74±2.93	5.98±2.97	4.28±2.44	3.63±2.35	3.83±2.48	3.77±2.44	3rd week	
4 Media±DS	4.18±2.47	3.83±2.36	5.67±2.82	6.39±2.82	4.6±2.52	4.26±2.41	4.53±2.66	4.21±2.5	4th week	
5 Media±DS	4.73±2.38	4.15±2.41	6.92±2.59	6.73±2.64	5.1±2.32	4.67±2.41	4.83±2.44	4.89±2.44	5th week	
6 Media±DS	4.72±2.34	4.26±2.22	6.37±2.45	6.28±2.65	5.1±2.32	4.94±2.33	5.03±2.54	4.95±2.39	6th week	

^ missing data 15.2%

Table 7. Actions taken in the presence of an outbreak of infection in Italy (in the absence of government measures).

Imagine this outbreak of infection in Italy. Indicate what action (s) you would take if needed?	n	%
Avoid public transport by bus or plane	3004	73.0%
Avoid going out to have fun like in bars, restaurants, theaters, cinemas	2268	55.1%
Limit shopping to the essentials	1661	40.4%
Don't go to work	592	14.4%
Do not take children to school (even if the school is still open)	1071	26.0%
Limit physical contact	2399	58.3%
Avoid seeing doctors. even if unrelated to the flu when you are sick of something	624	15.2%
Always stay at home	1112	27.0%

Table 8. Intention to vaccinate against some infectious diseases

	No % nº	Yes % nº	I do not know % nº
Seasonal flu	33.1 (1363)	53.8 (2214)	12.9 (532)
HIV (if available)	10.3 (424)	81.5 (3356)	8.1 (332)
Measles. mumps. rubella	6.7 (275)	89.1 (3666)	4.1 (168)
Meningitis	3.5 (143)	90.8 (3739)	5.6 (229)
Future possible Pandemic flu	4.8 (198)	82.2 (3382)	12.8 (527)

between the variable score and the following variables was therefore investigated: sex, age, educational level, region, occupation and typology of work in the healthcare area.

The analysis of the data shows the following:

1. Age: the age variable was dichotomized into 4 classes (30 years, 30-60 years, 61 years, 71 years) considering the type of clinical manifestation of the disease in the different age groups. From this analysis no statistically significant differences were deduced (p = 0.081).
2. Gender: there is a greater knowledge of women with a score of 24.89 ± 5.77 SD versus 23.96 ± 5.71 SD. These differences were statistical highly significant (p 0.001)
3. Region: no statistically significant differences were obtained. Nevertheless, with the exception of Valle D'Aosta the lowest score was obtained for Emilia Romagna (22.68) and the highest one for Umbria (28, however, only 5 records come from here) and Liguria. (26.36). However, if the data is analyzed by dichotomizing the sample into three macroareas (central, northern, southern Italy), a higher score is obtained in the areas of Northern Italy (29.06±5.88 SD vs 28.44 ±5.86 SD vs 28.53±6.09 SD; p 0.05). (Table 11 s).
4. Level of education: it was obtained that with the increase in the level of schooling the score increased proportionally, obtaining the maximum score in the presence of post-graduate training (Table 12 s)
5. Work: a higher score was obtained for public employees (which are probably attributable to the health workers interviewed) and for students (mainly in the medical area) with statistically significant differences (p 0.001). Similarly, moderately significant differences were obtained for the scores of subjects operating in the healthcare area (p = 0.002). Furthermore, dividing the sample into three categories (operators, students, general population) shows a higher score for

students (29,41±5.69 SD) versus health workers (29,24±5.98 SD) and general population (27,39±6.17 SD).

6. Survey execution week: the survey was launched on 10 February and was implemented until 30 May. Therefore, for convenience, we chose to divide the period as described above, obtaining an increasing trend of the score in the 6 weeks considered with statistically significant differences (p 0.001). (Tab 13 s). This result is also evident by considering the epidemiological and regulatory evolution of our country (tab 14s).
7. Perception of risk: similarly, to point 6, the greater perception of the possibility of contracting the disease (questions relating to the possibility of contracting the disease in the next 12 months in the presence or not of the adoption of prevention and vaccination measures) is associated with a score increase. Finally, if we refer to the severity of the perception of the risk of contracting the disease, it is noted that with increasing severity the score increases, with statistically significant differences (p 0.001) (Tab 15-16-17 s).

Perception of risk

Furthermore, a statistical analysis was carried out on the discrete variables related to the COVID 19 disease in relation to the variables of sex, age, region and type of work. In particular, in relation to the question relating to the severity of contracting the disease in the following year, an increasing perception was obtained as the categorical age increased, going from 6.5 to 7.44 with statistically highly significant differences (Tab 18 s) . Similarly, higher scores were found in females (male 6,642.58 versus female 6,842.69) with statistically significant differences (p 0.05). The Region to which they belong also highlighted differences in perception with higher values for Lombardy, Veneto and Emilia Romagna versus the rest of Italy (7,292.37 vs 6,772.69).

Finally, opposite to the score obtained, the risk in students was perceived as lower with statistically significant differences between the various categories (tab 18 s). The score also increased passing from the center (6,772.62) to the periphery (6,932.67; p 0.001). Analyzing the question relating to the perception of the risk of contracting the disease in the next 12 months, a higher score is shown with decreasing age (Table 19 s), in female subjects (3,221.09 versus 3,011,11) and for students (Tab 19 s) with statistically significant differences between the general population, operators and students. The score also increased going from the center (3.19 1.08) to the periphery (3.251.13; p 0.001). Finally, the differences in the perception of the risk of acquiring the disease in the presence of immunization were investigated, obtaining higher values in subjects in the age group of 30-60 years (Tab), of female sex (1,570.8 vs 1,660, 81) and for the general population (Tab 20 s).

Discussion

This study is the first to report risk perception in the general population and healthcare professionals in Italy on a national scale at the beginning of CoViD-19 pandemic. It also provides evidence-based recommendations needed for risk communication purposes, which are of paramount importance at this time. Recall that risk communication programs must produce reliable and relevant information during emergencies to inform people about risks, influence behavioral changes and encourage participation in decision-making regarding emergency measures. Communication must therefore be meaningful and understood by those who receive it (10-23). Risk communication should, therefore, first and foremost be based on a solid understanding of the factors underlying the perception of risk, risk attitudes and trust in authorities and the main communication sources (14,15). According to ECOM (Effective communication for outbreak management) (16) in the presence of a lack of knowledge on the part of the respondents of the disease (transmission, symptoms, preventive measures and therapies), communication of the risk is urgently required which focuses on the gaps found. In our sample we found a fair knowledge of the symptoms: fever, cough and, generally flu-like symptoms, were reported by most of the interviewees, while only 0.8% (n = 32) of the sample did not report/know any symptoms. Nonetheless, a

certain portion of the population has little knowledge also regarding the transmission methods, mortality burden and preventive measures available to date: in fact 10% believed that there was a vaccine (even before production of the first vaccine on phase 1, which however does not coincide with the availability of an effective and efficient vaccine). In any case, even if the percentages are small, they must be applied on a national scale with the consequences that even the inappropiate behavior of the single individual can lead to the generation of dangerous outbreaks. Furthermore, by analyzing the table "What to do if you suspect you have contracted the infection", we see how about 11% did not know they had to contact a specific number (1500), 16.6% that they had to wear the surgical mask (which only after it was made mandatory) in case of contact with other individuals and 6% did not know they had to use the "Bin it and wash your hands" strategy after using the handkerchief. The data on the strategy to be implemented to contact the doctor or hospital assistance, is even more problematic: a quarter of the sample would have gone to their doctor and a fifth would have gone directly to Emergency, and this certainly emphasizes the need for greater communication. Furthermore, it must be taken into account that the sample was distributed into three categories: students, health workers and the general population and that these results refer to the sample in general. The other point that ECOM places emphasis on is the urgency of communication of the perceived risk (How do respondents view the disease in terms of severity? Do they feel susceptible to the disease? How anxious are they?) From the sample, which was investigated in the sections "Perception of disease severity" and "Perception of susceptibility to disease and degree of anxiety". The analysis of the data shows a score of 7 with increasing averages with increasing age, but, in any case, lower than the average of other diseases and in particular of heart attack, tuberculosis and SARS (see Table 3) and with a reduction of the perception of gravity in the presence of preventive measures. According to ECOM, when most of the interviewees perceive the disease as very serious and overestimate the possibility of contracting the disease, there is a lot of anxiety and anguish, the urgency of risk communication is high. The degree of concern in our sample probably also expresses the state of infodemia and the social pressure to which he was subjected at least in the second temporal half of the study. In this regard, probably, a key role is played by the spread of conflicting news even in the international literature itself and the WHO itself has been pointed out for not having indicated in community environments the use of the surgical mask not as a measure of self-protection but rather to protect the community(17, 18). These results, however, are in line with what was reported in a study carried out in the United States and the United Kingdom, participants generally had good knowledge of the main mode of transmission of the disease and of the symptoms of COVID-19 disease. However, a substantial portion of the participants presented erroneous ideas about how to prevent an infection and how to access treatment. For example, 37.8% (95% CI 36.1% -39.6%) of US participants and 29.7% (95% CI 28.1% -31.4%) of UK participants found that wearing a common surgical mask was "highly effective" in protecting them from acquiring the disease (19). Another objective of ECOM's evaluation was the most important information that people wanted to receive about the disease and in the presence of a high demand for news, a high urgency of communication is required. Most of the interviewees in our sample stated that they want to know information about the possibility of prevention and a good percentage stated they want to know about the mode of transmission, symptoms and therapy. Finally, another point established by ECOM is the trust placed in the authorities as a source of information, which was high for half of the sample; nevertheless, the amount of information received from the government and government agencies is lower than that obtained from other sources, such as television (to which, at least in part, the bulletin produced by the Civil Protection and the large amount of information also disseminated by experts contributed involved in the management / communication of the epidemic) and websites. The trust placed in the government also had higher averages than that in other sources with the sole exception of the medical officer (5.97 vs 6.10). Furthermore, the statistical analysis shows a growing confidence with the increase in the week of data collection, which reassures us and does not pose a problem as regards the communication provided by the

institutions. Overall, therefore, there are some fronts on which it is necessary to work to level the degree of knowledge and perception of the disease ,also in view of possible current and future epidemic peaks. It would also be interesting to be able to compare our data with that of other countries. At present, some studies have been implemented both locally and internationally. In particular, a study published in Euro surveillance (20) in the Finnish population showed that the lack of knowledge generated further uncertainty which in turn also increased the perceptions of the "catastrophic" potential of the disease. "death" was described as "uncontrollable" and perceived as "probable" and the authorities were perceived as inadequate to protect the population both as information providers and as communicators. The subjects also had "stigmatizing attitudes towards foreign nationals" and "individuals who have resided in or traveled to foreign countries" which they regarded as sources of infection. The self-efficacy we found was low, in line with what was reported by Lohiniva et al who also observed a strong belief that the authorities can instead act to contain the infection (20). In our study, the students were the ones to obtain higher scores and, in general, to be less concerned in line with those reported by some authors (21). In one American study, risk perception was low (median score of 5 out of 10), and respondents trusted health professionals and health officials to obtain information on the COVID-19 disease. Most respondents were in favor of strict infection prevention policies to control the epidemic (22). Other data found in our study ~~is~~ was a greater concern together with a higher score of knowledge in female subjects in line with what was reported in a Spanish study, where, moreover, being women, young, having negative perceptions about one's aging, greater exposure to news about the disease, greater contact with relatives other than cohabitants, fewer positive emotions, less perceived self-efficacy, lower sleep quality, and greater loneliness were characteristics associated with greater discomfort (23). Particularly at risk is the category of dentists, not investigated by us ~~is that of dentists~~: according to a study carried out in Jordan, dentists were aware of the COVID-19 symptoms, the mode of transmission and the controls and measures to be taken against the infection in dental clinics. However, dentists had limited understanding of the additional precautionary measures that protect dental staff and other patients from COVID-19 (24). Other data not integrated by us is the psychological evaluation of the subjects during the epidemic phase; in a study the psychological implications of the disease were assessed at the Italian level on a sample of 500 individuals by observing a significant number of individuals with psychological distress following the COVID-19 epidemic (25). Similar results were observed in a study conducted in China where protective factors included a high level of trust in doctors, a high perceived probability of survival and a low perceived risk of contracting COVID-19, satisfaction with health information obtained and personal precautionary measures used (26). Some studies have focused attention on certain risk categories, such as cancer patients, noting that even among young individuals the perceived risk of experiencing serious consequences was high (27,28). A limitation of our study is that we did not discriminate perception on the basis of the presence or absence of comorbidities, which can however be investigated at a later stage. The study carried out investigates only a limited period of the epidemic event and it would be useful to extend the study to the post-epidemic phase to assess the perceived risks, knowledge and propensity for vaccination. Another possible selection bias is the highest reported propensity to vaccinate given the epidemic period. Finally, it would be useful to evaluate changes in the population with regard to vaccination hesitation. Generally, in fact, following an epidemic event, a "honeymoon" effect (29) can occur on incidence trends and vaccination coverage deriving from a greater anxiety towards infectious diseases. It would therefore be interesting to re-evaluate these implications after some time, remembering however that vaccination hesitation and compliance have a multifactorial component (30-31). Our study found that around 76% would get vaccinated if a vaccine for the disease were in place. The highest percentage of vaccination compliance was obtained for the meningococcal vaccine and MMR-chickenpox, in line with other studies (30-37). The data on the discrepancy between the question "would he vaccinate for the flu" and "would he do it for the pandemic flu" suggests that the word pandemic evokes greater fear in people's minds (38,39). Furthermore, in the study, the perception of risk was compared with age but not with the presence

of comorbidities, an important factor in the clinical manifestation and prognostic implications of the disease (40,41). The observational nature of the study poses problems related to the presence of systematic errors such as selection mechanisms in the recruitment of study participants (selection bias), selective recall or inconsistent data collection (bias bias), measurement errors, presence of confounding factors, social desirability bias etc . . (42). Finally, we can state that in the case of COVID-19 disease the factor that most affects the perception in the general population is the fact of being faced with an unknown threat, with the emergence of a new infectious agent. We are, therefore, in the field of so-called emerging risks (43), that is, the dangers we face for the first time and this aggravates the perception of risk since the uncertainty about the nature and the health, economic and social consequences amplifies the feeling of not being able to exercise control over events which in turn amplifies the perception of risk. Conversely, familiarity with a danger acts as a mitigating factor in the perception of risk and leads to underestimate the threat, so that, despite the high number of victims, we almost no longer pay attention to serious risks but we are now immersed in them as automobile accidents, air pollution or seasonal flu (44). Finally, according to the socio-cultural theory of risk, our assessments are also strongly influenced by ethics and social norms: if moral principles of freedom, equity or justice are violated, a risk can be socially unacceptable even in the presence of a limited number of victims (45). Acceptability, on the other hand, does not even require the absence of any risk, so much so that every day we face sources of risk that we accept by virtue of the benefits we obtain: examples are technological applications and even nuclear energy, opposed to nuclear power plants but whose use in the health sector is accepted by virtue of the direct benefits for patients. Finally, sometimes there is a tendency to contrast perceptions and rationality, and after all, we have developed a mechanism known as "flight or fight" as a defensive capacity (46). The downside is the possibility of falling into systematic errors of assessment (or bias) that can lead us to overestimate or underestimate a risk, making us make bad decisions. The mechanism that man has developed to deal with risks in an ancestral era may not adapt to the globalized and hyper-connected world in which we live.

In interpreting the results of our survey, we acknowledge its main limitations: sampling was opportunistic so that we cannot infer the results to the entire Italian population, the perception of risk was compared with age but not with the presence of comorbidities, an important factor in the clinical manifestation and prognostic implications of the disease. Also, the observational nature of the study poses problems related to the presence of systematic errors such as selection mechanisms in the recruitment of study participants (selection bias), selective recall or inconsistent data collection (bias bias), measurement errors, presence of confounding factors, social desirability bias etc…

Nonetheless, to our knowledge, this is the first study that investigates the impact of the COVID-19 pandemic on flu,COVID-19 and other vaccination intentions among people and the possible influencing factors.

Conclusions

In conclusion, the results of this study *could drive information campaigns* by health authorities, doctors and the media itself and more generally, could be an important tool for tracking public knowledge and misperceptions during the management of epidemics. Correct application of preventive measures and correct case management is in fact crucial in order to contain the pandemic we are experiencing (47).

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APPENDIX – Supplementary Materials

The following are available online at www.mdpi.com/xxx/s1; Table 1 s. Perception of the severity of communicable and non-communicable diseases by the sample (score from 1 to 10) expressed as a percentage by score, mean and SD; Table 2 s. Perception of susceptibility to disease; Table 3 s. Perception of susceptibility to disease in the presence or absence of preventive measures; Table 4s. Perception of efficacy against infectious diseases and COVID-19 disease; Table 5s. Perception of self-efficacy; Table 6s. Absolute frequency of reported symptoms; Table 7s. Knowledge related to the COVID 19 disease; Table 8s. Knowledge of the real preventive measures recommended by WHO; Tab 9 s. Information the subject would like to know; Tab. 10 s. Risk perceived in relation to the place; Table 11 s. Score obtained distributed by Region of residence; Table 12 s. Score obtained distributed by level of education; Table 12 s. Score obtained distributed by level of education; Table 13 s. Score obtained versus week of investigation; Table 14 s. Score versus week versus the possibility of contracting the new Coronavirus disease 2019 in the next 12 months in the absence of adoption of preventive measures; Table 15s. Score versus week versus the possibility of contracting the new Coronavirus disease 2019 in the next 12 months in the presence of the vaccine; Table 16 s. Score versus week versus the possibility of contracting the 2019 new Coronavirus disease in the next 12 months in the absence of vaccination; Table 17 s: Severity of the disease versus categorical age and professional category; Table 18 s. Perception of the risk of contracting the disease in the next 12 months versus categorical age and profession; Table 19s. Perception of the risk of contracting the disease in the next 12 months versus categorical age and profession in the presence of immunization;

Table 1s. Perception of the severity of communicable and non-communicable diseases by the sample (score from 1 to 10) expressed as a percentage by score, mean and SD

	1	2	3	4	5	6	7	8	9	10	Average	SD
Diabetes	1.4 (59)	4.7 (194)	8 (328)	5.4 (224)	8.4 (347)	10.1 (416)	16.2 (668)	22.7 (936)	10.5 (431)	12.4 (511)	6.74	2.37
A cold	63.9 (2632)	17.2 (709)	8.8 (362)	3.4 (142)	3.4 (139)	1.6 (66)	0.7 (27)	0.5 (21)	0.2 (7)	0.3 (11)	1.78	1.41
HIV	0.7 (28)	0.8 (34)	5.9 (242)	3.3 (135)	1.6 (67)	2.2 (91)	4.5 (184)	11.7 (481)	19.8 (815)	49.5 (2039)	8.53	2.19
Hypertension	1.6 (65)	5.4 (221)	7.4 (303)	5.9 (241)	10.8 (443)	12.4 (510)	18.6 (766)	20.6 (847)	9.2 (380)	8.2 (339)	6.46	2.28
SARS	1 (43)	2.2 (90)	7.1 (293)	4.8 (198)	5.1 (210)	6.9 (283)	11 (451)	16.6 (685)	17.5 (720)	27.7 (1139)	7.58	2.41
Tuberculosis	0.7 (30)	2 (81)	6.3 (261)	3.7 (151)	3.5 (143)	5.6 (231)	11.4 (471)	17.4 (716)	20 (823)	29.3 (1208)	7.82	2.29
Heart attack	0.6 (24)	0.7 (29)	6 (246)	2.9 (119)	1.5 (62)	1.7 (71)	4.8 (197)	12.5 (515)	23.5 (967)	45.8 (1886)	8.53	2.13
Influenza from a new virus	2.4 (99)	6.6 (270)	8.7 (358)	6.6 (272)	7.9 (326)	9.6 (397)	13.6 (558)	15.5 (639)	12.1 (497)	17 (700)	6.63	2.63
Food poisoning	9.6 (397)	13.6 (561)	12.7 (524)	10.4 (430)	14.4 (594)	12.7 (523)	11.6 (478)	8.7 (358)	3.3 (136)	2.8 (114)	4.74	2.43
SARS CoV-2 infection	1.8 (76)	5.6 (232)	8.9 (366)	6.5 (269)	7.8 (323)	8.8 (363)	11.9 (489)	14.2 (584)	13.6 (558)	20.8 (856)	6.85	2.65

Table 2s. Perception of susceptibility to disease

	1 ^ n %	2 ^ n %	3 ^ n %	4 ^ n %	5 ^ n %
Diabetes	2071 50.3	981 23.8	696 16.9	278 6.8	89 2.2
A cold	163 4	229 5.6	629 15.3	1211 29.4	1882 45.7
HIV	2510 61	915 22.2	421 10.2	138 3.4	128 3.1
Hypertension	1491 36.2	1205 29.3	871 21.2	366 8.9	181 4.4
SARS	2102 51.1	1041 25.3	681 16.5	195 4.7	92 2.2
Tuberculosis	2031 49.3	1167 28.4	649 15.8	182 4.4	84 2
Heart attack	1476 35.9	1193 29	966 23.5	360 8.7	116 2.8
Food poisoning	617 15	1011 24.6	1506 36.6	768 18.7	211 5.1
Influenza from a new virus	506 12.3	847 20.6	1500 36.4	960 23.3	301 7.3
SARS CoV-2 infection	551 13.4	798 20.6	1407 34.2	969 23.5	389 9.5

^ (1 = very unlikely; 2 = unlikely; 3 = not probable / not unlikely; 4 = probable; 5 = very probable).

Table 3s. Perception of susceptibility to disease in the presence or absence of preventive measures

Possibility of contracting the disease in the next 12 months . . .	1 n %	2 n %	3 n %	4 n %	5 n %
Without the adoption of general preventive measures	230 5.6	863 21	1393 33.8	1029 25	600 14.6
If vaccinated	2174 52.8	1289 31.3	528 12.8	97 2.4	27 0.7
If not vaccinated	201 4.9	599 14.6	1391 33.8	1263 30.7	661 16.1

Table 4s. Perception of efficacy against infectious diseases and COVID-19 disease.

	1 ^ n %	2 ^ n %	3 ^ n %	4 ^ n %	I do not know n %
Influenza from a new virus	158 3.8	922 22.4	1446 35.1	1489 36.2	99 2.4
SARS	152 3.7	751 18.2	1431 34.8	1486 36.1	291 7.1
New coronavirus	124 3	722 17.5	1482 36	1707 41.5	80 1.9
Common cold	568 13.8	1125 27.3	1063 25.8	1314 31.9	45 1.1

^ 1 = not at all 2 = a little bit 3 = a lot 4 = definitely

Table 5s. Perception of self-efficacy.

	1 ^ n %	2 ^ n %	3 ^ n %	4 ^ n %	I do not know n %
Influenza from a new virus	912 22.2	1893 46	943 22.9	232 5.6	133 3.2
SARS	938 22.8	1496 36.3	992 24.1	413 10.0	273 6.6
New coronavirus	941 22.9	1769 43	1014 24.6	286 6.9	103 2.5
Common cold	921 22.4	1382 33.6	1086 26.4	661 16.1	64 1.6

Table 6s. Absolute frequency of reported symptoms

Symptom	%	(n)
Cough	81.3%	3348
Pneumonia	56.6%	2329
Fever	88.0%	3624
Muscular pain	25.7%	1056
Flu-like symptoms	83.4%	3433
I don't know any symptoms	0.4%	16
I do not know	0.8%	32

Table 7s. Knowledge related to the COVID 19 disease

The new Coronavirus infection . . .	False	True	I do not know
. . . Is a communicable disease	0.5 (19)	99.1 (4078)	0.4 (18)
. . . It is always symptomatic	85 (3498)	7.1 (294)	7.8 (321)
. . . It can be deadly	6.1 (252)	91.9 (3782)	2 (81)
. . . There is a vaccine against the infection	89.9 (3701)	1.7 (69)	8.4 (345)
. . . Can be prevented with good hygiene	9.5 (392)	83 (3418)	7.4 (305)

Table 8s. Knowledge of the real preventive measures recommended by WHO

Do you think the following measures can help you prevent infection . . .	Certainly not % (n)	Probably no % (n)	Maybe yes maybe no % (n)	Probably Yes % (n)	Yes of course % (n)
Clean your hands frequently using an alcohol-based cleanser or soap and water;	0.9 (37)	1.7 (72)	6.5 (268)	35.6 (1464)	55.3 (2275)
When coughing and sneezing, cover your mouth and nose with your bent elbow or handkerchief, throw it away immediately, and wash your hands;	1.1 (47)	1.5 (63)	4.8 (196)	32.1 (1321)	60.5 (2489)
Avoid close contact with anyone who has fever and cough;	1.2 (49)	3.1 (128)	9.2 (377)	32.1 (1322)	54.4 (2238)

Table 8s (*Continued*)

Table 8s. Knowledge of the real preventive measures recommended by WHO (*Continued*)

Do you think the following measures can help you prevent infection . . .	**Certainly not % (n)**	**Probably no % (n)**	**Maybe yes maybe no % (n)**	**Probably Yes % (n)**	**Yes of course % (n)**
In case of fever, cough and breathing difficulties, consult a doctor immediately and share the history of any trip	1.7 (70)	1.9 (79)	4.7 (193)	24.8 (1020)	66.9 (2754)
If visiting live animal markets in areas that currently have cases, avoid unprotected direct contact with live animals and surfaces;	7.9 (326)	8.6 (356)	12.1 (497)	24.1 (993)	47.2 (1944)
Consumption of raw or undercooked animal products should be avoided.	10.5 (432)	13.2 (544)	17.21 (710)	25.7 (1059)	33.2 (1368)
Raw meat, milk or animal organs must be handled with care, to avoid cross-contamination with raw foods	6.2 (256)	8.7 (358)	14 (575)	24.8 (1019)	46.3 (1906)
Wear a surgical mask	23 (945)	22.5 (927)	24.4 (1003)	19.9 (820)	10.1 (414)
Wear a face filter mask	9.2 (377)	9.8 (403)	20.2 (832)	33.4 (1375)	27.3 (1123)
Use of antivirals	31.1 (1282)	19.3 (795)	22.5 (926)	17 (699)	9.9 (408)
Use of antibiotics	61.3 (2522)	16.7 (687)	12.1 (497)	6.6 (273)	3.2 (130)

Table 9s. Information the subject would like to know

Information to know	**%**	**No.**
How is this disease transmitted?	13.7%	562
How to recognize the symptoms	16.5%	678
How can infection be prevented	53.7%	2211
Geographical areas at risk	3.5%	145
How it is treated	8.6%	356
I do not know	0.9%	39
The possibility of contracting the disease	3.8%	156
All of the above	0.2%	10
Mortality and morbidity	0.1%	6
Other	0.6%	26

Table 10s. Risk perceived in relation to the place.

I will mention some places and would like to know where you think you run the greatest risk of infection . . .	**%**	**n**
On public transport	55.0%	2263
In bars, restaurants, theaters or cinemas	16.6%	684
In stores	0.7%	27
At work or at school	5.2%	216
In the hospital	22.4%	924
At home or with friends and family	0.6%	24

Table 11s. Score obtained distributed by Region of residence.

	No.	Average	DS
Abruzzo	120	23.28	5.13
Basilicata	11	25.82	6.65
Calabria	269	24.05	6.05
Campania	434	23.29	6.16
Emilia Romagna	309	22.68	5.82
Friuli Venezia Giulia	19	23.58	6.66
Lazio	132	24.58	5.04
Liguria	198	26.36	4.93
Lombardy	192	25.14	5.70
Marche	17	25.59	4.96
Molise	9	19.44	6.52
Piedmont	535	25.93	5.30
Puglia	514	24.36	5.51
Sardinia	583	25.79	5.70
Sicily	523	24.00	5.90
Tuscany	123	24.05	5.58
Trentino Alto Adige	11	24.64	5.99
Umbria	5	28.00	5.52
Valle d'Aosta	1	16.00	-
Veneto	96	24.29	5.23

Table 12s. Score obtained distributed by level of education

	No.	Average	DS	Pvalue
Elementary School	13	22.69	8.14	0.021
Middle school inf.	80	22.68	5.97	
High school	1916	24.48	5.73	
Graduation	2034	24.69	5.78	
master's degree	22	24.23	4.93	
PhD	45	25.76	5.22	

Table 13s. Score obtained versus week of investigation

	No.	Average	DS	Pvalue
1.00	491	26.49	6.22	0.001
2.00	668	27.53	5.94	
3.00	1003	28.98	6.03	
4.00	229	28.28	5.56	
5.00	694	30.86	5.30	
6.00	155	30.12	5.12	

Table 14s. Score versus week versus the possibility of contracting the new Coronavirus disease 2019 in the next 12 months in the absence of adoption of preventive measures

	No.	Media score	DS	Pvalue
1.00	551	23.26	6.01	0.001
2.00	797	24.05	5.96	
3.00	1404	24.78	5.69	
4.00	969	25.22	5.36	
5.00	388	24.95	5.86	

Table 15s. Score versus week versus the possibility of contracting the new Coronavirus disease 2019 in the next 12 months in the presence of the vaccine

	No.	Media score	DS	Pvalue
1.00	2172	24.98	5.63	0.001
2.00	1287	24.59	5.51	
3.00	528	23.06	6.33	
4.00	96	22.39	7.10	
5.00	27	24.96	5.37	

Table 16s. Score versus week versus the possibility of contracting the 2019 new Coronavirus disease in the next 12 months in the absence of vaccination

	No.	Average	DS	Pvalue
1.00	201	22.62	6.30	0.001
2.00	599	23.29	5.86	
3.00	1389	24.48	5.72	
4.00	1261	24.98	5.47	
5.00	660	25.62	5.81	

Table 17s. Severity of the disease versus categorical age and professional category

Age	No.	Average	Ds	Pvalue
<30 Years	2244	6.50	2.58	0.001
30–60 Years	1645	7.23	2.66	
>61 Years Old	181	7.55	2.67	
>71 Years	41	7.44	2.91	
Category				
Students	1708	6.42	2.58	
Healthcare Workers	1037	6.87	2.66	
General Population	1371	7.36	2.63	

Table 18s. Perception of the risk of contracting the disease in the next 12 months versus categorical age and profession

Age	No.	Average	Ds	Pvalue
<30 Years	2244	3.28	1.06	0.001
30–60 Years	1645	3.15	1.14	
>61 Years Old	181	3.14	1.19	
>71 Years	41	2.93	1.19	
Category				
Students	1708	3.31	1.04	
Healthcare Workers	1036	3.20	1.14	
General Population	1371	3.12	1.14	

Table 19s. Perception of the risk of contracting the disease in the next 12 months versus categorical age and profession in the presence of immunization

Age	No.	Average	Ds	Pvalue
<30 Years	2244	1.60	0.79	0.001
30–60 Years	1645	1.75	0.89	
>61 Years Old	181	1.70	0.89	
>71 Years	41	1.73	0.81	
Category				
Students	1708	1.59	0.79	
Healthcare Workers	1036	1.66	0.86	
General Population	1371	1.76	0.86	