Short report

Risk perception of COVID-19 among Portuguese healthcare professionals and the general population

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A R T I C L E   I N F O

S U M M A R Y

Risk perception assessment of COVID-19 among Portuguese Healthcare Professionals (HCPs) and the general population (GPop) was evaluated in a snowball sample of 3403 individuals, 54.9% of HCPs believed there was a high probability of becoming infected, in contrast with 24.0% of the GPop ($P{<}0.001$) and, in more than a quarter, that this could happen to their family. Regarding prophylactic isolation, more than 70% agreed with its effectiveness. A large proportion perceived that health services were poorly prepared (50.1% GPop vs 63.5% HCPs, $P{<}0.001$). Regarding health authorities' communication, about 60% were "moderately" satisfied. The opinion that the pandemic could be controlled in 3—6 months was held by 46.7% of the GPop and 52.8% HCPs ($P{=}0.01$).
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Introduction

At the end of 2019, a set of pneumonia cases of unknown cause was reported in Wuhan, Hubei Province, China. Later, on 9th January 2020, the Chinese Center for Disease Control and Prevention reported a new virus belonging to the coronavirus family [1]. These micro-organisms are responsible for a number of diseases in animals and humans, from the common cold to severe acute respiratory syndrome (SARS) or Middle East respiratory syndrome (MERS) [2]. The disease associated with this virus (known as SARS-CoV-2) is currently referred to as COVID-19. On 30th January, the World Health Organization (WHO) declared COVID-19 as an international public health emergency

and, on 11th March, a pandemic, with the request for a sudden change in lifestyle of the population and major adaption of health systems to respond to the growing demands. In this exceptional situation, communication with the population and health professionals was essential, to allow them to make 'informed decisions'. In order to receive feedback from these two population groups, we conducted this study to assess the risk perception of the Portuguese general population (GPop) and healthcare professionals (HCPs) regarding COVID-19 impact.

Methods

Epidemiological context

Between 17th and 22nd March 2020, Portugal was in containment phase for COVID- 19. In this period, transmission chains in Europe were present, as well as imported cases at national level, but absence of secondary chains and moderate

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Table I

Sociodemographic characteristics of the participants and their risk perceptions related to COVID-19 ($N = 3403$)

Characteristics	N (%)	Perception area		N (%)		P
		Questions		GPop	HCP	
Gender						
Female	2672 (78.5)					
Male	731 (21.5)	1. What is the probability of you being infected with this virus?	High	686 (24.0)	299 (54.9)	<0.001
			Moderate	1611 (56.4)	212 (38.9)	
Age Group (years old)			Low	545 (19.1)	31 (5.7)	
18–24	129 (3.8)		None	16 (0.6)	3 (0.6)	
25–34	698 (20.5)					
35–44	1194 (35.1)					
45–54	854 (25.1)	2. What is the probability of your family/friends being infected with this virus?	High	721 (25.2)	162 (29.7)	<0.01
55–64	388 (11.4)		Moderate	1703 (59.6)	319 (58.5)	
≥65	140 (4.1)		Low	415 (14.5)	63 (11.6)	
			None	19 (0.7)	1 (0.2)	
Education						
No formal education	2 (<0.1)					
Basic (1st to 9th grade)	162 (4.8)	3. How effective do you think "prophylactic isolation" (quarantine) is in controlling this virus?	Very	2063 (72.2)	403 (73.9)	0.257
High School (10th to 12th grade)	738 (21.7)		Moderately	767 (26.8)	139 (25.5)	
Bachelor	1612 (47.4)		Poorly	21 (0.7)	3 (0.6)	
Master	708 (20.8)		Not effective	7 (0.2)	0 (0.0)	
PhD	181 (5.3)					
Professional Group		4. How prepared are Health Services to deal with this virus?	Very	73 (2.6)	9 (1.7)	<0.001
Intellectual and scientific activities	1126 (33.1)		Moderately	1102 (38.6)	130 (23.9)	
Intermediate level technicians	926 (27.2)		Poorly	1433 (50.1)	346 (63.5)	
Administrative staff	373 (11.0)		Not prepared	250 (8.7)	60 (11.0)	
Unemployed	282 (8.3)					
Sales and protection workers	203 (6.0)					
Not qualified workers	160 (4.7)	5. What is the level of communication adequacy of the Health Authorities with the population?	High	635 (22.2)	71 (13.0)	<0.001
Qualified industry workers	142 (4.2)		Moderate	1653 (57.8)	327 (60.0)	
Legislative and executive organisms	123 (3.6)		Low	507 (17.7)	125 (22.9)	
Armed forces	30 (0.9)		None	63 (2.2)	22 (4.0)	
Machinery and assembly operators	19 (0.6)					
Farmers, fishing and forest	19 (0.6)					
		6. When will it be possible to control this pandemic at European level? (in months)	<1	59 (2.1)	1 (0.2)	0.01
HCP's	**545 (16.0)**		1–3	743 (26.0)	103 (18.9)	
Doctors	183 (33.6)*		3–6	1336 (46.7)	288 (52.8)	
Nurses	161 (29.5)*		6–12	566 (19.8)	134 (24.6)	
Therapeutic Technicians	95 (17.4)*		>12	154 (5.4)	19 (3.5)	
Pharmacists	87 (16.0)*					
Others	19 (3.5)*					

GPop, general population; HCPs, healthcare professionals.

* Percentage based on the total number of HCPs.

risk of local spread of the disease in Portugal. On 17th March, there were 642 confirmed cases and one death. In these 5 days, there was an increase of 1418 cases (3.2 times more) and 22 deaths.

Participants and questionnaire design

Cross-sectional, descriptive and analytical study. Citizens resident in Portugal (including HCPs) were eligible to participate. Exclusion criteria: children (<18 years of age) and/or non-residents in Portugal and/or doctors (residents or specialists) in public health. Snowball convenience sampling was used. Participants were asked to answer a questionnaire, available online between 17th and 22nd March 2020. The questionnaire was made up of two parts: (1) participants' socio-demographic information; (2) area of perception, assessed through six questions, Likert scale type.

Statistical analysis

The questionnaire was developed using the Google Forms platform (©Google). Descriptive and analytical analysis was performed using software R 3.5.19. Considering continuous variables, the difference in means between the GPop and HCP was assessed using t-test for independent samples. A significance level of 5% was considered.

Results

Sociodemographic information

Most of the 3403 participants were female (78.5%) and 35.1% were in the age group of 35–44 years old, followed by 45- to 54-year-olds (25.1%) and 25- to 35-year-olds (20.5%). The majority lived in the two main urban areas: Porto (47.8%) and Lisbon (16.5%). Regarding the participants' education, the vast majority had a higher level (47.4% bachelor, 20.8% master and 5.3% PhD). Overall, 545 were HCPs (16.0%) and, of those, 33.6% were physicians, 29.5% nurses, 17.4% therapeutic technicians and 16.0% pharmacists (Table I).

Risk perception

Regarding the likelihood of family and friends becoming infected, about 60% in both groups felt there was a "moderate" probability. However, there was a large discrepancy regarding the probability of becoming infected themselves, namely, the majority of GPop accepted it as being "moderately likely" but, among HCPs, their opinion was divergent (54.9% considered it to be "very likely" and 39% "moderately likely"). Regarding the perceived effectiveness of the quarantine measures, there was no significant difference between the two population groups, with more than 70% believing it to be "very effective". Most participants had the opinion that communication from the Health Authorities was "moderately adequate" (57.8% of the GPop and 60.0% of the HCPs). When asked about health services' preparations to manage this pandemic, 63.5% of the HCPs responded with "poorly prepared" (vs 50.1% of the GPop who had the same opinion). Analysing the answers given to the question "when will it be possible to control this pandemic at the European level?", 52.8% of HCPs and 46.7% of the GPop

responded that this pandemic could be controlled within 3–6 months (Table I).

Discussion

A recent publication, in which the opinion of several experts was explored, suggested that media coverage has prompted a significant level of fear of the virus. Many requests were received for SARS-CoV-2 testing based on perceived, but not actual, risk of exposure [3]. In another study, a sample of North American and British individuals responded that it was probable that, by the end of 2020, about 60% and 70% of the population in their country would be COVID-19 positive, respectively [4]. Conversely, during the SARS outbreak in 2003, there were several reports of nosocomial infection by this agent in HCP's [3]. In the current pandemic, there are reports of 3,8% of COVID-19 cases in HCP's in China, 10% in Italy and 20% in Spain [5]. In our questionnaire, 24.0% of the GPop and 54.9% of HCPs believed they were "very likely" to become infected with SARS-CoV-2 (P<0.001) and 25.2% of the GPop and 29.7% of HCPs believed that this could happen to their family/friends (P<0.01) (Table I). This indicates that HCPs had the perception of being at higher risk than the GPop, due to their close contact with suspected/confirmed COVID-19 cases.

As a public health measure, it is essential to limit cross-transmission and avoid amplification events. According to the European Center for Disease Control and Prevention (ECDC), "quarantine" or "self-isolation" is supported by evidence from previous pandemics, in which isolation of exposed individuals contributed to delay the peak of the epidemic curve. There are considerable logistical, social and communication challenges in implementing quarantine measures and its efficiency is dependent on the definition and, in particular, the scale of exposure in the target population [6]. In our questionnaire, the vast majority of the respondents, faced with the question "how effective do you think quarantine is in controlling this virus?", answered "very effective" (72.2% of the GPop and 73.9% of HCPs), followed by "moderately effective" (26.8% and 25.5%, respectively) (Table I). This positive perception about the potential effectiveness of quarantine measures is important in understanding and predicting population behaviour, when deciding to implement these measures.

In healthcare settings, nosocomial outbreaks can work as local amplifiers. Weber *et al.*, when reviewing past pandemic experiences, recommended that all healthcare units have contingency plans to deal with these pathogens, namely for early identification and isolation of cases, as well as the availability of personal protective equipment and HCP training [7]. Part of the objectives of the Portuguese 'National Plan for Preparation and Response to COVID-19', is to strengthen HCPs', patients' and visitors' safety, as well as healthcare units' capacities to respond to this pandemic. In this scenario, national healthcare systems are under pressure and, ultimately, at risk of collapsing and failing to respond to demanding requests. According to Armocida *et al.*, in the most affected regions of Italy, the National Health Service was close to collapse, as a result of years of fragmentation, financial and human resources divestment in infrastructures. They concluded there are several lessons to be learned, namely the need for consistent management choices and a strong political commitment to create a long-term sustainable system [8].

Regarding the question, "in your opinion, how ready are health services to deal with this virus?", 50.1% of the GPop and 63.5% of HCPs stated that they were "poorly prepared" (Table I). Interestingly, it was the HCPs that most felt the lack of preparation of the health services, perhaps because they had better knowledge of their weaknesses.

Health authorities are often involved in damage control caused by several kinds of risks (including pathogens). One of the challenges in risk communication is the different perception of distinct population groups (such as legislators, researchers, HCPs, etc.). Given the current situation, Portuguese Health Authorities implemented a risk communication strategy, which included: daily communications; press conferences; online information for different audiences; technical guidelines for HCPs; adaptation and adoption of the international recommended guidelines (ECDC and WHO), in accordance with the national risk assessment level and institutional partners involvement. In this study, most participants were of the opinion that the health authorities' communication with the population has been "moderately adequate" (57.8% of the GPop and 60.0% of HCPs) and 22.2% of the GPop and 13.0% of HCPs, responded "very adequate" ($P<0.001$) (Table I). These results could be explained by the anxiety created in the whole population, due to the uncertainty of the pandemic scenario and its intensive media coverage.

Regarding the participants' perception about the time horizon for the pandemic control in Europe, the prevailing opinion was between 3 and 6 months (46.7% of the GPop vs 52.8% of HCPs, $P=0.01$). Considering the 'basic reproduction number' (R_0), as the average number of secondary infection cases generated by a primary case in a susceptible population, Liu *et al.* concluded that, for SARS-CoV-2, it is between 2 and 3, which is indicative of its potential to spread [9]. As already referred, to avoid/limit this spread, several public health measures can be taken. Hellewell *et al.* simulated several models, concluding that a highly efficient contact tracking and adequate case isolation are sufficient measures to control the SARS-CoV-2 pandemic in 3 months. However, the probability of control decreases with the delay from symptom onset to isolation, the probability of being able to trace contacts, the proportion of transmission that occurs before symptom onset and the proportion of subclinical infections [10].

In conclusion, in recent decades new infectious agents have emerged, some of which have become major global threats. The new SARS-CoV-2 pandemic is an example of an international public health emergency. Considering the international epidemiological scenario, exceptional public health measures were taken (which included isolation and social distance), with considerable logistical, social, economic and communication challenges. In this study, we assessed the risk perception in a snowball sample of the GPop and HCPs. The results obtained showed a significant proportion of HCPs (vs GPop) who believed there was a high probability of being infected with SARS-CoV-2 and that this could happen to their family/friends. Regarding prophylactic isolation, a significant majority relied on its effectiveness to control this virus. Conversely, many had the opinion that the health services were poorly prepared to deal with this pandemic (interestingly, more HCP). In terms of the adequacy of the communication from the Health Authorities, the majority were "moderately satisfied". Finally, most respondents believed that it could be possible to control the situation within 6 months.

Acknowledgements

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