

SHORT ARTICLE

Knowledge about pandemic flu among Italian Health Care Workers (HCWs): an Italian survey

C. CADEDDU, D. DI THIENE*, W. RICCIARDI, A. BOCCIA*, G. LA TORRE*

Institute of Hygiene, "Sacro Cuore" Catholic University, Rome; *Department of Public Health and Infectious Diseases, Sapienza University of Rome, Italy

Key words

Knowledge • Pandemic flu • Health care workers

Summary

Introduction. In case of pandemics, healthcare workers (HCWs) are the main actors and, at the same time, one of the main targets of preventive measures. This is what occurred in 2009 during the A/H1N1 pandemic flu.

The aim of our survey was to get information about HCWs' knowledge of the A/H1N1 pandemic flu prevention.

Materials and methods. A survey of 32 questions, 11 of which about knowledge towards A/H1N1 pandemic flu, created on the basis of a similar one by the Harvard School of Public Health, was made available on the Italian Journal of Public Health website during the month of October 2009. The survey was advertised with links from various professional websites and by emailing to HCWs' addresses taken from the Italian Society of Hygiene and Public Health (SIItI) databases. Descriptive and univariate analyses were conducted in order to assess whether differences exist on the level of knowledge of HCWs (specifically Nurses and Physicians) about preventive measures against the A/H1N1 pandemic flu.

Results. 1,960 HCWs answered to the questionnaire, 1,711 (87.3%) Nurses and 249 (12.7%) Physicians. Both Nurses and Physicians seemed to have a high or moderately high interest for A/H1N1 pandemic flu (86.1% vs. 91.2% respectively, $p = 0.03$). Nurses indicated national newscasts (38.6%) and communications within hospitals or other workplaces (33.8%) as the source of most information about A/H1N1 pandemic flu. On the other hand Physicians got information mostly from Internet (41.8%), but also from communications within their hospital or other workplace (34.5%) ($p < 0.001$). Not all the Nurses and Physicians knew that contagion is possible by close contact (less than 1 metre) with someone affected (74.0% and 88.0% respectively, $p < 0.001$), while 82.3% of Nurses and 71.1% of Physicians reported that face masks protected from getting infected ($p < 0.001$).

Conclusion. Information and awareness campaigns on the influenza pandemic should be conducted firstly among HCWs, because of their importance – especially in case of pandemics – as a valuable resource at risk, as a contagion vehicle and as a source of information for the general population.

Introduction

The principle that Health Care Workers (HCWs) have a duty of care has led to the inviolability of the patient-doctor relationship and has justified the obligations of HCWs. This is much true in case of pandemics, when the help of HCWs is needed more than ever [1]. At the same time in this situation, the risk for them to be a source of infection for their patients gets much worse, so correct knowledge of the illness and its means of prevention would be of even more importance.

Several challenges, related to scientific, administrative, as well as legal and ethical aspects, come out in preparing for an influenza pandemic [1]. From these points of view, it is important to learn from measures implemented during past infectious diseases epidemics and pandemics, as to be ready, in case of future events, to rightly organise the nation's infrastructure and capabilities for an efficient and effective mobilisation [1]. It is therefore a relevant matter for a nation to be able to count on its own health resources, especially on the human ones, who should always be ready and prepared to emergencies such as a pandemic.

The 2009 influenza A/H1N1 pandemic has been only moderately severe, but this could not be true for future pandemics, as history teaches us. This is why it is important to learn from experience and avoid repeating the same mistakes, especially for HCWs involved in the first line of help for the population [2].

Taking into consideration other studies which analysed the same topic in different countries [3-6], we conducted a survey in order to gather information about knowledge related to the spreading of A/H1N1 pandemic, focusing on the Italian health care context.

Materials and methods

On the basis of a similar telephonic questionnaire used by the Harvard School of Public Health (USA) [7], a survey of 32 questions regarding A/H1N1 pandemic flu was developed by the Department of Public Health and Infectious Diseases of the Sapienza Università di Roma and made available on the Italian Journal of Public Health website (<http://www.ijph.it>) for the whole month of October 2009.

Eleven questions dealt with knowledge of A/H1N1 influenza, eleven with attitudes and behaviours about its prevention and the remaining investigated socio-demographic aspects. The survey was advertised both with links from various professional websites and with email sent to approximately 2,000 HCWs registered to the Italian Society of Hygiene and Public Health (SII), invited to answer the questionnaire online and anonymously. Socio-demographic characteristics of the sample were analysed in order to make a basic description of the sample. To investigate the association between occupation (Nurse or Physician) and knowledge of A/H1N1 influenza, a univariate analysis was carried out performing χ^2 test.

The level of statistical significance was set at $p \leq 0.05$. The statistical analysis was performed using SPSS 13.0 for Windows.

Results

HCWs participating to the survey were 1,960 (12.7% Physicians and 87.3% Nurses). Most of them had less than 50 years (77.9%), were female (69.4%), married or cohabitant (78%), Nurses (87.3%) and living in Northern Italy (56.2%).

Results of univariate analysis show that both Nurses and Physicians seemed to have a high or moderately high interest in A/H1N1 pandemic flu (86.1% vs. 91.2% respectively, $p = 0.03$).

As the source of most information about A/H1N1 pandemic flu, Nurses indicated national newscasts (38.6%) and communications within hospital or other place of job (33.8%), as opposed to Physicians who got most information from Internet (41.8%), but also from communications within their hospital or other workplace (34.5%) ($p < 0.001$). Almost all Nurses and Physicians were aware of the existence of a vaccine against A/H1N1 pandemic flu (94.8% vs. 94.4% respectively, $p = 0.02$); not so about the existence of an effective therapy for A/H1N1 pandemic flu (66.9% of the Nurses replied "Yes" vs. 76.3% of Physicians, $p = 0.005$).

Physicians knew better than Nurses that contagion is possible by getting in close contact (less than 1 metre) with someone affected (74.0% vs. 88.0%, respectively, $p < 0.001$), while 26.7% of Nurses and 29.3% of Physicians believed contagion was possible at a distance larger than 1 metre from an affected individual ($p = 0.30$). Few Nurses (1.8%) and only one Physician (0.4%) even answered, probably apparently misled by the name of "Swine flu", that it was possible to get infected by eating pork meat ($p = 0.01$) and, maybe for the same reason, 7.1% of Nurses and 7.6% of Physicians gave an affirmative answer to the possibility of getting affected by A/H1N1 pandemic flu by coming in contact with pigs ($p = 0.93$). Eighty-two point three percent of Nurses and 71.1% of Physicians replied that face masks protects *one* from infection ($p < 0.001$) and almost the same percentage of Nurses compared to Physicians knew that wearing

face masks protects *others* from being infected (86.3% vs. 86.7% respectively, $p = 0.90$).

Discussion

Results from this online survey showed that HCWs' knowledge about A/H1N1 influenza was quite good. In relation to the meaning of A/H1N1 virus compared to that of the pandemic flu, answers given show confusion among both the classes of HCWs, which is probably due also to the not so clear formulation of the respective question.

Most of HCWs declared to be very interested in being updated about A/H1N1 influenza and this could be related to the much different and often contrasting news circulating in the first period of spread of the virus. It is notable that the main source of information for Nurses was national newscasts, while Physicians took most information from Internet. This may explain the doubts of HCWs about A/H1N1 influenza knowledge: indeed the press extensively addressed and contributed to raising awareness of influenza prevention strategies and pandemic risk perception, highlighting the importance of vaccine prevention, but it was not always consistent with the scientific recommendations regarding the target population or the timing and modalities of the vaccine administration [8]. For this reason it would be advisable to improve the quality of media communication about health issues, through a stronger co-operation between medical researchers and journalists, as well as to make reporters understand that journalistic efficacy is possible without distorting scientific health knowledge [9]. Better information would also have the advantage of lowering the degree of worry and psychological distress among HCWs that is of key importance for them in times of extreme pressure, such as pandemics [10]. The choice of a non-scientific source of information for HCWs could also be due to the early level of pandemic alert, and this could have been an influential factor for attitudes and behaviours towards A/H1N1, especially for the willingness of being vaccinated against it [11-13]. A good awareness is a key factor in influencing attitudes and behaviours [14, 15].

Lack of HCWs knowledge, in our study, regards means of transmission and of prevention: 26.7% of Nurses and 29.3% of Physicians answered that someone could get pandemic flu by standing at more than a metre from an affected subject, showing probably an excessive fear for a pandemic which consequences were not already well known in October 2009.

HCWs had not clear information about protection given by face mask, with a statistically significant difference between Nurses and Physicians. Not all HCWs recognized the usefulness of this means of prevention and appropriate interventions ought to be taken to reduce the risk of exposure among HCWs and patients, included the adherence to recommendations for the use of masks, as suggested in other studies [16].

Tab. I. Univariate analysis (knowledge about A/H1N1 influenza among HCW).

Knowledge		Nurses (%)	Physicians (%)	p
How much are you interested to be updated about A/H1N1 pandemic flu?	<i>A lot/Enough</i>	1473 (86.1)	227 (91.2)	0.027
	<i>Not so much/Not at all/I don't know/No answer</i>	238 (13.9)	22 (8.8)	
Which was your principal source of information concerning A/H1N1 pandemic flu?	<i>National newscasts</i>	661 (38.6)	38 (15.3)	< 0.001
	<i>Communications within hospital/workplace</i>	578 (33.8)	86 (34.5)	
	<i>Internet</i>	271 (15.9)	104 (41.8)	
	<i>Newspapers</i>	158 (9.2)	18 (7.2)	
	<i>Satellite newscasts</i>	22 (1.3)	2 (0.8)	
	<i>Local TVs</i>	21 (1.2)	1 (0.4)	
Does a vaccine against A/H1N1 pandemic flu exist?	<i>Yes</i>	1622 (94.8)	235 (94.4)	0.017
	<i>No</i>	56 (3.3)	14 (5.6)	
	<i>I don't know/No answer</i>	33 (1.9)	0 (0.0)	
Does an effective therapy against A/H1N1 influenza exists?	<i>Yes</i>	1145 (66.9)	187 (75.1)	0.005
	<i>No</i>	412 (24.1)	53 (21.3)	
	<i>I don't know/No answer</i>	154 (9.0)	9 (3.6)	
Is it possible to contract A/H1N1 influenza standing less than 1 metre from someone affected?	<i>Yes</i>	1266 (74.0)	219 (88.0)	< 0.001
	<i>No</i>	355 (20.7)	23 (9.2)	
	<i>I don't know/No answer</i>	90 (5.3)	7 (2.8)	
Is it possible to contract A/H1N1 influenza standing more than 1 metre from someone affected?	<i>Yes</i>	457 (26.7)	73 (29.3)	0.30
	<i>No</i>	1073 (62.7)	157 (63.1)	
	<i>I don't know/No answer</i>	181 (10.6)	19 (7.6)	
Is it possible to contract A/H1N1 influenza by eating pork?	<i>Yes</i>	30 (1.8)	1 (0.4)	0.01
	<i>No</i>	1638 (95.7)	248 (99.6)	
	<i>I don't know/No answer</i>	43 (2.5)	0 (0.0)	
Is it possible to contract A/H1N1 influenza coming in contact with pigs?	<i>Yes</i>	122 (7.1)	19 (7.6)	0.93
	<i>No</i>	1486 (86.8)	214 (85.9)	
	<i>I don't know/No answer</i>	103 (6.1)	16 (6.5)	
Do face mask protect from getting sick from A/H1N1 influenza?	<i>Yes</i>	1408 (82.3)	177 (71.1)	< 0.001
	<i>No</i>	245 (14.3)	65 (26.1)	
	<i>I don't know/No answer</i>	58 (3.4)	7 (2.8)	
Wearing a face mask while being sick does avoid A/H1N1 virus diffusion?	<i>Yes</i>	1477 (86.3)	216 (86.7)	0.90
	<i>No</i>	184 (10.8)	27 (10.8)	
	<i>I don't know/No answer</i>	50 (2.9)	6 (2.5)	

Actually there is the need to learn more and better about influenza epidemics, pandemics and the value of vaccination since University student courses: the results of a recent study in fact show that the underestimation of a preventable disease such as influenza, the lack of knowledge about the benefits of immunization and the wrong perception of risk lead to a low coverage of influenza vaccination among medical and nursing students, against all recommendations for these categories [17, 18].

Our study has some limitations: the use of an online questionnaire could have affected the reliability of the answers, have introduced a selection bias related to the need of Internet skills and consequently brought to the exclusion of an older age group from the sample. Moreover, it could be highlighted a lack of homogeneity between the number of individuals composing the two groups interviewed (Nurses and Physicians).

Strength of the study is the large sample size and the timeliness used for collecting data, just at the beginning of the pandemic that allowed us an appropriate and more reliable analysis of data.

Conclusions

What comes out from our survey is that there is no sufficient concern of health knowledge, specifically of prevention and promotion, firstly paradoxically among HCWs, which consequently feeds the scepticism towards efficacy and safe means of prevention (i.e. vaccines) and contributes to their large underutilization.

It is therefore important to spread right knowledge about influenza among HCWs, also from a viewpoint of spreading the correct knowledge and promote prevention in the general population: HCWs are often a model for patients, who look at them as examples to follow in matters of health.

Information and awareness campaigns on the influenza epidemics and pandemics topic addressed to HCWs should be thus conducted as the first step, in order to optimize an appropriate allocation of resources for a right health knowledge and promotion among the general population.

References

- [1] Voo TC, Capps B. *Influenza pandemic and the duties of healthcare professionals*. Singapore Med J 2010;51:275-81.
- [2] Pahlman I, Tohmo H, Gylling H. *Pandemic influenza: human rights, ethics and duty to treat*. Acta Anaesthesiol Scand 2010;54:9-15.
- [3] Imai T, Takahashi K, Todoroki M, et al. *Perception in relation to a potential influenza pandemic among healthcare workers in Japan: implications for preparedness*. J Occup Health 2008;50:13-23.
- [4] Oria PA, Matini W, Nelligan I, et al. *Are Kenyan healthcare workers willing to receive the pandemic influenza vaccine? Results from a cross-sectional survey of healthcare workers in Kenya about knowledge, attitudes and practices concerning infection with and vaccination against 2009 pandemic influenza A (H1N1), 2010*. Vaccine 2011;29:3617-22.
- [5] Ma X, He Z, Wang Y, et al. *Knowledge and attitudes of healthcare workers in Chinese intensive care units regarding 2009 H1N1 influenza pandemic*. BMC Infect Dis 2011;11:24.
- [6] Tebruegge M, Pantazidou A, Ritz N, et al. *Perception, attitudes and knowledge regarding the 2009 swine-origin influenza A (H1N1) virus pandemic among health-care workers in Australia*. J Paediatr Child Health 2010;46:673-9.
- [7] Harvard Opinion Research Program. *Harvard School of Public Health SWINE FLU (H1N1 VIRUS) SURVEY April 29, 2009*. www.hsph.harvard.edu/news/press-releases/files/Swine_Flu.TOPLINE.pdf [last access: April 29, 2011].
- [8] Monti S, Zuccaro V, De Vecchi F, et al. *H1N1 2009 influenza vaccine prevention: a comparison between the Italian press and the scientific recommendations*. Ital J Publ Health 2011;1(8):48-59.
- [9] Leask J, Hooker C, King C. *Media coverage of health issues and how to work more effectively with journalists: a qualitative study*. BMC Public Health 2010;10:535.
- [10] Goulia P, Mantas C, Dimitroula D, et al. *General hospital staff worries, perceived sufficiency of information and associated psychological distress during the A/H1N1 influenza pandemic*. BMC Infect Dis 2010;10:322.
- [11] Gholami J, Hosseini SH, Ashoorkhani M, et al. *Lessons Learned from H1N1 Epidemic: The Role of Mass Media in Informing Physicians*. Int J Prev Med 2011;2:32-7.
- [12] Hidiroglu S, Ay P, Topuzoglu A, et al. *Resistance to vaccination: the attitudes and practices of primary healthcare workers confronting the H1N1 pandemic*. Vaccine 2010;28:8120-4.
- [13] La Torre G, Di Thiene D, Cadeddu C, et al. *Behaviours regarding preventive measures against pandemic H1N1 influenza among Italian healthcare workers, October 2009*. Euro Surveill 2009;14. pii:19432.
- [14] Kozlowski LT, Kiviniemi MT, Ram PK. *Easier said than done: behavioral conflicts in following social-distancing recommendations for influenza prevention*. Public Health Rep 2010;125:789-92.
- [15] Paget J. *The influenza pandemic and Europe: the social impact and public health response*. Ital J Public Health 2009;3:257-9.
- [16] Brandt C, Rabenau HF, Wicker S. *Attitudes of influenza-vaccinated health care workers toward masks to prevent nosocomial transmission of influenza*. Influenza Other Respi Viruses 2011;5:61-6.
- [17] Falato R, Ricciardi S, Franco G. *Influenza risk perception and vaccination attitude in medical and nursing students during the vaccination campaigns of 2007/2008 (seasonal influenza) and 2009/2010 (H1N1 influenza)*. Med Lav 2011;102:208-15.
- [18] European Centre for Disease Prevention and Control (ECDC). *Why healthcare workers are a priority group for pandemic influenza A(H1N1) vaccination? 6 October 2009*. http://ecdc.europa.eu/en/activities/sciadvic/Lists/ECDC%20Reviews/ECDC_DispForm.aspx?List=512ff74f%2D77d4%2D4ad8%2Db6d6%2Db0f23083f30&ID=664 [Last access: April 30, 2011].

■ Accepted on August 1, 2011.

■ Correspondence: Chiara Cadeddu, Institute of Hygiene, "Sacro Cuore" Catholic University, Largo F. Vito 1, 00168 Roma, Italy - Tel. +39 06 35001525 - Fax +39 06 35001522 - E-mail: chiara.cadeddu@edu.rm.unicatt.it