

Concerns, perceived impacts and preparedness of health care workers in a referral hospital in Egypt in facing influenza (H1N1) epidemic

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Key words

Influenza A • H1N1 • Pandemic • Health Care workers • Chest specialty hospital • Egypt

Summary

Objective. In Egypt, influenza A(H1N1) cases have been detected and deaths have been reported. The aim of this study was to investigate Concerns, Perceived Impacts and Preparedness of Physicians and Nurses of Chest Specialty Hospital in Cairo (Egypt) concerning Influenza A(H1N1).

Methods. A questionnaire was applied to a total of 72 Physicians and 41 Nurses from Chest Specialty Hospital in Cairo (Egypt).

Results. More than half of physicians (55.6%) were men, while most of nurses (92.7%) were women. The mean age in years of physicians was 36.6 ± 11.3 compared to 26.5 ± 8 in nurses. Physicians feel that they are at greater risk by their job to the pandemic 100% compared to 87.6% among nurses and the difference is highly significant. More than one third of the studied physi-

cians reported that they are not ready to face H1N1 pandemic. Residents feel less ready to face the danger of Influenza A(H1N1) compared with Consultants and Specialists/Assistant Specialists, with no statistical significant difference. In concordance, Residents reported less Personal Protective Equipment training compared with Consultants and Specialists/Assistant Specialists, with no statistical significant difference. All Consultants received Seasonal Influenza Vaccine compared with Specialists/Assistant Specialists (68.2%) and Residents (44.7%).

Conclusion. Higher work related and non work related stress was found among physicians compared to nurses, which reflects the demand of more information and training courses for physicians about the pandemic nature and its consequences, complications, and methods infection prevention.

Background

In late April 2009, the World Health Organization (WHO) announced the emergence of a novel influenza A virus. This particular H1N1 strain has not been circulated previously in humans and required WHO to raise the pandemic alert to phase 5 less than 1 week after declaring phase 3. On 11 June 2009, WHO declared a phase 6 influenza pandemic alert, which is the maximum alert level [1].

Health Care Workers (HCWs) are a strategic target for Pandemic Influenza A(H1N1) prevention such as vaccination and frequent hand-washing, since they are at higher risk themselves of contracting influenza, can place their patients at risk and are critical for a functioning health care system [2].

Since April 2009, the WHO Regional Office for Eastern Mediterranean has elaborated a global plan against pandemic influenza for Member States in the Region, including Egypt [3].

The Egyptian Ministry of Health and Population (MoHP) adopted all the recommendations of the WHO Regional Office for Eastern Mediterranean and implemented a national plan to prevent and control Influenza A(H1N1) infection [4].

The aim of this study was to investigate Concerns, Perceived Impacts and Preparedness of Physicians and Nurses of Chest Specialty Hospital in Cairo (Egypt) concerning Influenza A(H1N1).

Methodology

A random sample of Physicians and Nurses of Chest Specialty Hospital in Cairo (Egypt) was invited to participate in the study, interviewer from October 1, 2009 to November 10, 2009. The studied Chest Specialty Hospital was built in the early sixties to diagnose and treat all chest diseases. The hospital is a referral centre, fully equipped to receive critical patients. This Chest Specialty Hospital could serve over five million persons. Patients with chest symptoms because of Influenza A(H1N1) virus could seek medical care at or referred by other medical centres to the out patient clinic of this hospital.

The participation rate was 60% among all the working staff in that hospital; higher participation rate for doctors 64% compared to 52% among nurses.

All participants signed an informed consent after explaining them the objective of the study. Thereafter,

participates were provided a self-administered questionnaire which consisted of five sections, in order to investigate Concerns, Perceived Impacts and Preparedness of Physicians and Nurses of Chest Specialty Hospital in Cairo (Egypt) regarding Influenza A(H1N1).

The 5 sections included questions about:

1. Demographic data
2. Work related concerns of Physician and Nurses of Chest Specialty Hospital.
3. Non-work related concerns of Physician and Nurses of Chest Specialty Hospital.
4. Perceived impact of Physician and Nurses of Chest Specialty Hospital regarding Influenza A(H1N1) pandemic on personal life and work
5. Preparedness of Physician and Nurses of Chest Specialty Hospital for a Influenza A(H1N1) pandemic.

Our questionnaire was adopted from a previous questionnaire used to study the preparedness of HCWs from Singapore for possible Avian Influenza Pandemic [5]. The questionnaire was formulated according to our objectives and was tested on 5 Physicians of Chest Specialty Hospital before its use. Pilot study was of help in formulating and structuring the questions in slang Arabic language.

STATISTICAL METHODS

First, the following descriptive analysis was done: frequency, percent, mean, standard deviation. Initial com-

parisons between Physician and Nurses were done using the student's t-test for continuous variables and Pearson's Chi square test for categorical variables. Thereafter, Pearson's Chi square test was used to compare the preparedness and attitude of Consultants, Specialists/Assistant Specialists and Residents. Level of significance was set at $p < 0.05$. All data variables were encoded and computerized. Data entry and statistical analysis were performed using the Statistical Package for Social Science (SPSS) version 15.0 (SPSS Inc., Chicago, Illinois).

Results

Seventy-two physicians and forty-one nurses were included in our study. More than half of physicians (55.6%) were men, while most of nurses (92.7%) were women. The mean age in years of physicians was 36.6 ± 11.3 (range 22-59) compared to 26.5 ± 8 (range 18-52) in nurses. The participant Physicians were Consultants (16.7%), Specialists/Assistant Specialists (30.5%) and Residents (52.8%).

Table I shows a higher work related stress among physicians compared to nurses as all physicians reported an endangering risk of exposure to H1N1 from his job, while only 87% of nurses reported this danger and the difference is highly significant statistically ($P < 0.01$).

Tab. I. Work related concerns of Physician and Nurses of Chest Specialty Hospital in Cairo.

Work related concerns Health Professional	Physician N = 72 (%)	Nurse N = 41 (%)	P Value
I feel that my job would put me at great risk of exposure to Influenza A(H1N1)	72 (100)	36 (87.6)	0.002
I would be afraid of falling ill with Influenza A(H1N1)	67 (93.1)	37 (90.2)	0.59
I feel that I should not be looking after patients with Influenza A(H1N1)	16 (22.2)	13 (31.7)	0.26
I would accept that the risk of contracting Influenza A(H1N1) is part of my job	39 (54.2)	25 (61)	0.48
I might look for another job or consider resigning because of the risk of contracting Influenza A(H1N1)	4 (5.6)	4 (9.8)	0.40
I would consider it acceptable if my colleagues resign because of their fear of Influenza A(H1N1)	7 (9.7)	4 (9.8)	0.99
I am confident that my employer would look after my medical needs if I were to fall ill with Influenza A(H1N1)	49 (68.1)	33 (80.5)	0.15

Tab. II. Non-work related concerns of Physician and Nurses of Chest Specialty Hospital in Cairo.

Non-work related concerns Health Professional	Physician N = 72 (%)	Nurse N = 41 (%)	P Value
People close to me would be at high risk of getting Influenza A(H1N1) because of my job.	64 (88.9)	28 (68.3)	0.007
I would be most concerned of my:			
Family.	66 (91.7)	34 (82.9)	0.16
Close friends.	59 (81.9)	34 (82.9)	0.89
Work colleagues.	64 (88.9)	35 (85.4)	0.58
People close to me would be worried for my health.	69 (95.8)	35 (85.4)	0.04
People close to me would be worried as they may get infected by me.	66 (91.7)	28 (68.3)	0.001

Also it is noted that lower percentage of physicians (68.1%) feel that their employers would care for their treatment compared to nurses (80.5%).

In concordance, Table II shows higher non work related stress among physicians compared with nurses. About 89% of Physicians have higher worries of spreading infection to their families compared with 68.3% of nurses, with a statistical significant difference ($P < 0.01$). Physicians also feel that their families would get worried about their infection in their work as well as the spread of the virus to the family members.

It is surprisingly that about one-third of Physicians and Nurses believe that people might avoid their family members because of their work in the Chest Specialty Hospital. Also, more than one-third of the nurses plan to avoid telling other people about the nature of their work (Tab. III).

Table IV shows a higher involvement of nurses (73%) in infection control meetings compared with physicians (54%) and the difference is significant statistically ($P < 0.05$). Moreover, less physicians (54.2%) received seasonal influenza vaccine compared to nurses (75.6%) and the difference is significant statistically ($P < 0.05$). The overall seasonal influenza vaccination coverage in our study is 61.9%

Table V shows that Residents feel less ready to face the danger of Influenza A(H1N1) compared with Consultants and Specialists/Assistant Specialists, with no statistical significant difference. In concordance, Residents reported less Personal Protective Equipment training compared with Consultants and Specialists/Assistant Specialists, with no statistical significant difference. Of note, all Consultants received seasonal influenza vaccine compared with Specialists/Assistant Specialists (68.2%) and Residents (44.7%).

Tab. III. Perceived impact of Physician and Nurses of Chest Specialty Hospital in Cairo regarding Influenza A(H1N1) pandemic on personal life and work

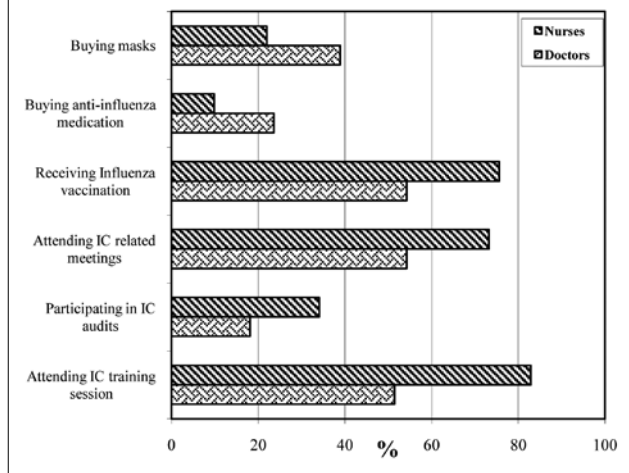
Perceived impact on personal life and work Health Professional	Physician N = 72 (%)	Nurse N = 41 (%)	P Value
I would be afraid of telling my family about the risk I am exposed to	34 (47.2)	24 (58.5)	0.24
People would avoid me because of my job	38 (52.8)	16(39)	0.15
People would avoid my family members because of my job	22 (30.6)	17 (41.5)	0.24
I would avoid telling other people about the nature of my job	9 (12.5)	16 (39)	0.001
There would be adequate staff at my workplace to handle the increased demand	43 (59.7)	29 (70.7)	0.24
There would be more conflict amongst colleagues at work	24 (33.3)	24 (58.5)	0.009
I would feel more stressed at work	62 (86.1)	37 (90.2)	0.52
I would have an increase in workload	65 (90.3)	37 (90.2)	0.99
I would have to work overtime	42 (58.3)	15 (36.6)	0.02
I would have to do work not normally done by me	40 (55.6)	20 (48.8)	0.48

Tab. IV. Preparedness of Physician and Nurses of Chest Specialty Hospital in Cairo for Influenza A(H1N1) pandemic.

Preparedness for Influenza A(H1N1) pandemic Health Professional	Physician N = 72 (%)	Nurse N = 41 (%)	P Value
There is an infection control committee in my clinic	72 (100)	41 (100)	1.0
I have received training for infection control at my clinic	63 (87.5)	39 (95.1)	0.18
I received adequate personal protective equipment training	65 (90.3)	38 (92.7)	0.66
I have someone to turn to if unsure of use of personal protective equipment	69 (95.8)	39 (95.1)	0.86
I have been recommended by my clinic to receive influenza vaccination	59 (81.9)	35 (85.4)	0.64
There is infection control staff in my clinic	69 (95.8)	40 (97.6)	0.63
My clinic has a preparedness plan for Influenza A(H1N1) outbreak	64 (88.9)	35 (85.4)	0.58
I have seen the plan to combat Influenza A(H1N1) infection in my hospital	66 (91.7)	35 (85.4)	0.29
I am personally prepared for Influenza A(H1N1) outbreak	46 (63.9)	30 (73.2)	0.31
Over the last 6 months, I have attended infection control training sessions	37 (51.4)	34 (82.9)	0.001
Over the last 6 months, I have participated in infection control audits	13 (18.1)	14 (34.1)	0.05
Over the last 6 months, I have attended infection control related meetings	39 (54.2)	30 (73.2)	0.04
Over the last 6 months, I have received influenza vaccination	39 (54.2)	31 (75.6)	0.02
Over the last 6 months, I bought anti Influenza A(H1N1) medication	17 (23.6)	4 (9.8)	0.06
Over the last 6 months, I bought masks	28 (38.9)	9 (22)	0.06

Tab. V. Comparison between Consultants, Specialists/Assistant Specialists and Residents as regard the preparedness and attitude towards Influenza A(H1N1) Pandemic.

Preparedness and attitude towards Influenza A(H1N1) Pandemic	Number (%)	Chi Square	P Value
Ready to face the danger of Influenza A(H1N1)			
• Consultants	8 (66.7)	0.4	0.8
• Specialists/Assistant Specialists	15 (68.2)		
• Residents	23 (60.5)		
Personal Protective Equipment training			
• Consultants	12 (100)	3.5	0.16
• Specialists/Assistant Specialists	21 (95.5)		
• Residents	32 (84.2)		
Received Seasonal Influenza Vaccine			
• Consultants	12 (100)	3.1	0.2
• Specialists/Assistant Specialists	15 (68.2)		
• Residents	17 (44.7)		

Fig. 1. Preparedness for Influenza A(H1N1) pandemic during the last 6 months as reported by the interviewed Physician and Nurses of Chest Specialty Hospital in Cairo.

Discussion

Our study aimed to evaluate the preparedness and attitude of Egyptian HCWs to face Influenza (H1N1) Epidemic.

Before reaching conclusions based on the present results, it is necessary to consider a number of potential objections to the methodology. Simple tool such as self administrated questionnaire is considered methodologically suspect by many investigators. The main disadvantage of the self-administered mode is that the response rate is typically low and it is difficult to know of the characteristics and view of non-respondents, thus the study findings might not be generalizable. In addition, the questions must be worded simply for the self administered mode because there is no interviewer to clarify them [6]. Our pilot study tried to avoid the bias of unclear questions by formulating and structuring the questions in slang Arabic language. Our results show that most of physicians and nurses (95.6%) feel at great risk because of their work and possible contact with Influenza A(H1N1) patients. But, only half of them (46.9%) believe that that they should not be look-

ing after patients with Influenza A(H1N1) and only 7% would consider resigning to avoid the risk of contracting influenza.

Our results coincide with the results of previous study conducted in Germany, where the majority of HCWs recognized the obligation to treat patients despite the potential risks [7].

Less than 70% of participants physicians were confident that the Egyptian MoHP will look after their medical needs if they fall ill with Influenza A(H1N1). This calls for more information and clear guidelines to the Egyptian HCWs about measures to protect and treat infected physicians and nurses, especially in Referral and Chest Hospitals.

It is clear from our results that there are higher non work related stress and family stress among physicians compared with nurses. Curiously, in a previous survey on 644 German HCWs, > 21% of participants agreed that HCW without children should primarily care for the influenza patients [7].

More than 50% of physicians believed that people would avoid them because of their job, and about 30% of physician reported that people may avoid their family members for the same reason. Previous study conducted in Singapore about preparedness of HCWs for possible Avian Influenza Pandemic showed similar results to ours. HCWs felt that people would avoid them (63.5%) and their families (54.1%) during an influenza pandemic [5].

Most of Physicians and Nurses (> 90%) were worried about excess workload in case of Influenza (H1N1) Epidemic. This thought was expected as most of physicians believe that seasonal influenza produces overload of work every year [8].

All Physicians and Nurses were aware about the presence of infection control committees in the hospital and most of them received training for infection control. Also, our HCWs confirmed receiving training for infection control and having received adequate personal protective equipment training. This proves the effectiveness and success of the National Infection Control Program implemented by the Egyptian MoHP since late 2001 [9].

Less than 2/3 of our Physicians feel prepared for Influenza A(H1N1) outbreak compared with 73.3% of our

Nurses. Of no doubt, Physicians need more information to enable early diagnosis and an early start to the therapy which would help to decrease fatality and to prevent the spread of the virus.

Our results showed that > 60% of our HCWs received seasonal influenza vaccine, with less vaccination among Physicians compared with Nurses.

Previous study conducted in a Geriatric Hospital in Villejuif (France) revealed that only 21% of HCWs received seasonal influenza vaccine. The study was conducted in late 2006, and this explains the low seasonal influenza vaccination acceptance by HCWs with no threat of possible Influenza Pandemic. In contrary to our study, French Nurses refused seasonal influenza vaccination more than French Physicians [10].

In concordance with our results, previous study conducted in Singapore reported overall coverage rate of seasonal influenza vaccine of 56.8% (Physicians > 50%

and Nurses > 65%). This high coverage of seasonal influenza vaccination among HCWs can be explained by the heightened awareness of impending Avian Influenza Pandemic when this study was conducted [11].

Of note, our study showed that all Consultants received seasonal influenza vaccine compared with Specialists/ Assistant Specialists and Residents. Previous study in New Jersey (USA) reported seasonal influenza vaccination refusal among medical residents during the 2004-2005 influenza season. The most common reason reported for vaccine refusal the perception of a low risk of contracting influenza [12].

In conclusion, Professional ethical guidelines allowing for balancing the needs of society with personal risks are needed to help HCWs fulfill their duties in the case of a pandemic influenza, especially that human cases of H5N1 highly-pathogenic Avian Influenza are reported regularly in Egypt [13].

References

- [1] WHO. *Global influenza surveillance network: laboratory surveillance and response to pandemic H1N1 2009*. Wkly Epidemiol Rec 2009;84:361-5.
- [2] Hampton T. *H1N1 vaccine urged for health workers, but some resist getting on board*. JAMA 2009;302:1848-9.
- [3] WHO Regional Office for Eastern Mediterranean. *Pandemic (H1N1) 2009. Surveillance, Forecasting and Responses*. <http://www.emro.who.int/csr/h1n1/index.htm> (accessed June 12, 2010).
- [4] The Ministry of Health and Population. *Plan and Procedures against Influenza A(H1N1) Pandemic*. http://www.mohp.gov.eg/swine_flu/procedures.aspx (accessed June 12, 2010).
- [5] Wong TY, Koh GCh, Cheong SK, et al. *Concerns, perceived impact and preparedness in an avian influenza pandemic--a comparative study between healthcare workers in primary and tertiary care*. Ann Acad Med Singapore 2008;37:96-102.
- [6] Eysenbach G, Wyatt J. *Using the Internet for surveys and health research*. J Med Internet Res 2002;4:E13.
- [7] Ehrenstein BP, Hanses F, Salzberger B. *Influenza pandemic and professional duty: family or patients first? A survey of hospital employees*. BMC Public Health 2006;6:311.
- [8] Alvarez Pasquín MJ, Pericas Bosch J, Gómez Marco JJ. *The flu: this overload of work that strikes us every year [Article in Spanish]*. Aten Primaria 2005;36:295-6.
- [9] Talaat M, Kandeel A, Rasslan O, et al. *Evolution of infection control in Egypt: achievements and challenges*. Am J Infect Control 2006;34:193-200.
- [10] Trivalle C, Okenge E, Hamon B, et al. *Factors that influence influenza vaccination among healthcare workers in a French geriatric hospital*. Infect Control Hosp Epidemiol 2006;27:1278-80.
- [11] Yang KS, Fong YT, Koh D, et al. *High coverage of influenza vaccination among healthcare workers can be achieved during heightened awareness of impending threat*. Ann Acad Med Singapore 2007;36:384-7.
- [12] Bishburg E, Shah M, Mathis AS. *Influenza vaccination among medical residents in a teaching hospital*. Infect Control Hosp Epidemiol 2008;29:89-91.
- [13] Peyre M, Samaha H, Makonnen YJ, et al. *Avian influenza vaccination in Egypt: Limitations of the current strategy*. J Mol Genet Med 2009;3:198-204.

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