Reasons for and barriers to influenza vaccination among healthcare workers in an Australian emergency department

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KEY WORDS

Influenza, emergency department (ED), healthcare workers (HCW).

ABSTRACT

Objective
To examine attitudes and beliefs to influenza vaccination among healthcare workers in an Australian emergency department and to assess the vaccine uptake for 2007 influenza season and intentions for the 2008 season.

Design
Cross-sectional study using a self administered questionnaire.

Setting
Emergency department of an urban teaching hospital in Australia.

Subjects
Participants included all ED staff both clinical and non-clinical/administrative.

Main outcome measure
Self reported reasons for and barriers against vaccination; proportion of staff vaccinated in 2007 and willingness to get vaccinated in 2008 in staff categories were asked.

Results
Response rate was 90% (63 of 70). The overall vaccination rate reported in 2007 was 58.7% and the reported rate of those willing to be vaccinated in 2008 was 71.4 % (p=0.057). Vaccine was freely provided to all staff by the institution and 88.9% stated they had no problems in accessing vaccine. Performance of the vaccination in relation to knowledge and attitudes with particular interest in reasons for having or not having the vaccine was investigated.

Conclusion
Despite campaigns by the infectious disease unit and an outbreak of influenza A in Australia with confirmed cases by laboratory tests being in the department, misconceptions about the vaccine were common and only 56.4% of nurses and 58.7% of all staff including nurses were vaccinated in 2007 with an expected uptake of 71.4% in 2008. Some staffs attitude towards the vaccine remained unchanged; therefore combined strategies in campaigns may be needed to increase the vaccine uptake.

INTRODUCTION

The influenza virus has been known to be one of the major causes of morbidity and mortality worldwide, with worse outcomes for the young, the elderly and the chronically ill (CDC 2007; Tapiainen et al 2005; McBean et al 2004). Vaccines have been developed for seasonal influenza outbreaks and usually targets influenza A (H1N1), (H3N2) and influenza B. World Health Organization also encourages the use of the vaccine in humans at risk of H5N1 (avian influenza) stating that, vaccination with current inter-pandemic vaccine will not protect humans from infection with avian H5N1 influenza – rather, it minimises the risk of co-infection and genetic reassortment of human and avian influenza viruses in humans (WHO 2004). In Australia, laboratory confirmed influenza is a notifiable disease in all jurisdictions (McKay 2009). The Australian National Health and Medical Research Council (NHMRC) CEO in a pre-influenza season media release recommended vaccination for, anyone over 65 years and of any age with risk factors such as diabetes, heart disease or severe asthma, anyone with suppressed immunity due to illness or medication, pregnant women, people of Aboriginal or Torres Strait Islander origin and health care workers (Warwick 2008). Routine vaccination of healthcare workers is also recommended by many institutions and its benefits in reducing occupational risk of infection is well documented (Hofmann et al 2006).

Approximately 2,500 Australians die each year from influenza related complications and with over one million people in the at risk groups as defined by the NHMRC, a proactive approach has to be taken to protect them and the people who care for them (Warwick 2008). It has been speculated that, HCW's in the ED are an important target group in breaking the cycle of infection spread for two reasons: (1) they stand high chances of contracting the illness since they attend to the sick during the pandemic; and (2) they can be one of the main sources of the spread of infection as HCW's come into contact with many high risk clients.

The economic benefit of the vaccine to staff members, healthcare institutions and the country is summarised by a study conducted at a Japanese hospital from December 1999 through to March 2000. It examined the effectiveness of influenza vaccine in reducing illness, absenteeism, and health care use among healthcare workers. The results found that among vaccine recipients, the number with febrile illness, severe illness, and febrile upper respiratory-tract illness was significantly greater than among non recipients. Use of prescription antibiotics and over the counter medications was also reduced. Influenza vaccine also reduced the reported days of absence from work. The net effect was a reduction in cost to the provider, the patient, and generally the entire healthcare delivery system (Piccirillo and Gaeta 2006).

A high vaccination coverage of HCW's therefore is important but many HCW's in Australia remain unvaccinated (Bull et al 2007; Halliday et al 2003). Improvement can be achieved if the reasons for, and above all, barriers against vaccination in these important groups are better understood (McCormack and McCall 2008). A cross-sectional study was undertaken to gain insight into the reasons for and barriers to vaccination in HCW's of an urban ED department among ED staff and to assess, the general vaccination coverage during the last year's flu season as well as intention to receive vaccination during the upcoming season.

METHODS

A self administered questionnaire was distributed to all available emergency department staff during April and May 2008. The self administered questionnaire was distributed on site to doctors and nurses who work with direct patient contact and administrative workers (clerical and wardsmen) who also have contact with patients. The structured questionnaire of the survey generally addressed issues of influenza immunisation in HCW's. Especially the present immunisation status and future influenza immunisation plans, knowledge about

the immunisation, knowledge of and exposure to immunisation recommendations were covered. In an open ended question, reasons for taking or not taking the immunisation were asked and later in the questionnaire, a series of potential influencing factors such as contact at home to young children (<5 years of age) and elderly (>65 years of age) were recorded. Additionally some known barriers to influenza vaccination were prompted in the questionnaire such as allergy to eggs, allergy to another vaccine component, pregnancy, severe reactions during prior immunisations and the belief that the vaccine may cause influenza. Furthermore associations of the occurrence of influenza during the last season, vaccine status and productive time lost as a result of influenza illness were recorded.

The data were entered from the hard-copy questionnaire into a database and analysed using SPSS (version 16.0 for Windows).

RESULTS

A total of 70 out of 75 ED staff were present during the study period and invited to participate; out of these 63 staff completed the questionnaire resulting in a participation rate of 90%. Participants were predominantly female (66.7%) with age distribution as shown in table 1 below. The nursing discipline had the largest representation among the participants with 62% (n=39) while medical and administration was similarly represented at 19% (n=12) each.

Table 1: Gender and AgeGroup Crosstabulation

	Age Group				
Gender	**18-25**	**26-35**	**36-45**	**Over 45**	**Total**
Male	1	8	7	5	21
Female	6	12	9	15	42
Total	7	20	16	20	63

The overall self reported influenza vaccination proportion for the 2007 season was 58.7% (37/63) while 71.4% (45/63) stated that they were planning to take up influenza vaccination for the 2008 season (p=0.057 exact McNemar test). Neither the 2007 vaccination proportion, nor the projected 2008 proportions were significantly associated with gender, age group, discipline or employment status (for details please refer to table 6).

The main reasons stated for having had the vaccine in 2007 among those vaccinated (n=37) are recorded in table 2 below in descending order of frequency.

Table 2: Reasons for having the influenza vaccination in 2007 (n=37)

Reasons	Frequency	Percent
Protect self against flu	37	58.7
Prevent cross-infection	26	70.3
I have it routinely as annual immunisation	16	43.2
Required by the institution	7	18.9

The main reasons stated for not having had the immunisation in 2007 (n=26) are recorded in table 3 below in descending order of frequency.

Table 3: Reasons for not having had the influenza vaccination in 2007 (n=26)

Reasons	Frequency	Percent
Vaccine causes influenza	7	26.9
Not concerned	6	23.1
Trust in/Wish to challenge natural immunity	5	19.2
Not all strains are covered	2	7.7
Others* (each)	1	3.8

*prior experience of severe localised reaction to the vaccine, allergy to vaccine and physicians advice were all named once each.

Table 4 below shows the main reasons stated for intending to get immunised during the 2008 season (n=45) in descending order of frequency.

Table 4: Reasons for intending to get immunised in 2008 (n=45)

Reasons	Frequency	Percent
I care about my clients/patients	24	53.3
I have child contact at home	18	40
I am convinced by infection control depts. campaign	14	31.1
Pandemic getting worse as per 2007	6	13.3

The main reasons mentioned for not intending to have the vaccine in 2008 (n=18) are shown in table 5 below in descending order of frequency.

Table 5: Reasons for not intending to get immunised in 2008 (n=18)

Reasons	Frequency	Percent
Trust in or the wish to challenge natural immunity	6	33.3
Vaccine causes influenza	5	27.8
Others (each)**	1	5.6

**previous severe localised reaction, will not be a healthcare worker, physicians advice, not concerned and do not see the benefits were all named once.

The self reported incidence of influenza like illness during the 2007 season was 11.5% (n=3) in those who did not take the influenza vaccination in 2007 (n=26; 41.3%) and was 13.5% (n=5) in those who took the vaccination in 2007 (n=37; 58.7%); this difference is not significant (p>0.9).

All five of the vaccinated participants with an influenza like illness had to take sick leave during the episode (between one and three days) which compares to two out of three unvaccinated participants (between one and three days); not significant (p>0.9).

Table 6: 2007 vaccinated proportion and 2008 projected vaccination proportions in relation to basic demographics, discipline, employment status and contact to children/elderly.

	2007 Vaccination	p-value	2008 Vaccination	p-value
Age group				
18-25 yrs.	71.4% (5/7)		85.5% (6/7)	
26-35 yrs.	65.0% (13/20)		55.0% (11/20)	
36-45 yrs.	31.3% (5/16)		75.0% (12/16)	0.29
>45 yrs.	70.0% (14/20)	0.09	80.0% (16/20)	
Gender				
male	61.9% (13/21)		76.2% (16/21)	
female	57.1% (24/42)	0.79	69.0% (29/42)	0.77
Discipline				
medical	58.3% (7/12)		58.3% (7/12)	
nursing	56.4% (22/39)		74.4% (29/39)	
clerical/wardsmen	66.7% (8/12)	0.93	75.0% (9/12)	0.54
Employment				
part time	57.1% (24/42)		73.8% (31/42)	
full time	61.9% (13/21)	0.79	66.7% (14/21)	0.57
Children <5 in household				
no	65.2% (30/46)		76.1% (35/46)	
yes	41.2% (7/17)	0.15	58.8% (10/17)	0.22
Elderly >65 in household				
no	56.9% (33/58)		69.0% (40/58)	
yes	80.0% (4/ 5)	0.39	100% (5/5)	0.31

A total of 18 (28.6%) participants had contact with a confirmed influenza A case during the 2007 influenza season at work in the department. Out of these, three (16.7%) suspect they acquired the influenza during the 2007 season which compares to five (11.1%) coming down with influenza out of those (n=45; 71.4%) who had no contact to a confirmed influenza case at work (not significant; p=0.68).

The contact to a confirmed influenza case at work did not significantly (p=0.36) influence the planned influenza vaccination behaviour for the following (2008) season. 61.1% (n=11) of those having had contact to a confirmed influenza A case in 2007 planned to take the vaccination in 2008, while 75.6% (n=34) of those without reporting such contact were planning to get vaccinated in 2008.

DISCUSSION

The benefits of influenza vaccination to Australian HCW's and the end results to their service recipients have been emphasised by various institutions such as NHMRC (Warwick 2008). Ofstead et al (2008) mentions HCW's with direct patient contact as is the case with nurses being at high risk for influenza infection with serological evidence suggesting 13%-23% of HCW's experience influenza each year.

With a vaccination rate of 58.7% in 2007 and an expected rise to 71.4% in 2008 among participants at the Canberra based ED. In particular the nursing discipline vaccination rate of 56.4% in 2007 and an expected increase to 74.4% (table 6) in 2008, this is an encouraging increase for staff uptake of the vaccine. Even though this uptake is not optimum when compared to rates published from other institutions such as 21% from a tertiary geriatric hospital in Villejuif, France during 2004/2005 (Trivalle et al 2006), 28% from staff in aged care facilities in the ACT in 2000 (Halliday et al 2003), 38% from Victorian public hospitals during 2005 (Bull et al 2007), 50% from a New York metropolitan ED in 2004 (Piccirillo and Gaeta 2006) and 53% from staff caring for high-risk paediatric patients in paediatric prevention network hospitals in the United States of America during 2000/2001 (Bryant et al 2004). There were also well performing institutions, St. Jude children's research hospital in Memphis, Tennessee recorded vaccination rates of 45% in 2003 but since the institution attends to patients with complex health needs who are immunosuppressed, these low rates prompted an intensified campaign to vaccinate employees. The outcome of the campaign was positive with a rise of vaccinated HCW's to 80% in 2004 (McCullers et al 2006).

The most popular reason for having the vaccine among immunised participants was self protection against the flu. Other studies also show self protection as being a major factor in HCW's vaccination rates (Christini et al 2007). Seventy percent of participants were concerned about their colleagues, clients and community in preventing cross infection which also concurs with similar studies (Steiner et al 2002). Popular reasons mentioned for not having the vaccine include 'trust in, or the wish to challenge natural immunity', 'physician's advice against the vaccine for medical reasons', 'severe localised effects from the vaccine', and 'not believing the vaccine to have any benefit'. Staff confidence in their health as an inhibiting factor against the vaccine was also mentioned by Song et al (2006) in Korea. The other major reason for not having the vaccine was the belief that it causes influenza (27%), this belief exists despite a vigorous campaign by institutions like National Institute of Clinical Studies (NICS) and NHMRC through the hospitals infection control department to dispel the myth that the vaccine may cause influenza.

Vaccination uptake among the staff was not influenced by having contact with children who are ≤five years old or the elderly ≥65 years old at home despite these groups being universally classified as at risk by the majority of the institutions/ organisations.

CONCLUSION

This study reveals a possible upward trend when 2007 vaccine coverage (58.7%) is compared with the expected vaccine uptake for 2008 (71.4%) within the same population. Though the expected vaccine coverage for nurses who mostly maintain contact with patients (74.4%) in 2008 is a good figure, a mixed method of strategies with more campaigns tailored to the barriers need to be conducted if even better results are to be realised. Reasons cited for the vaccine uptake are mostly on protection to self and others. Barriers against vaccination identified in 2007 are also anticipated to exist in 2008. Therefore, to overcome these barriers and increase uptake, it is recommended that a vaccination campaign needs to be carefully designed and tailored to address staff beliefs such as: (1) trust in or the wish to challenge natural immunity; and (2) vaccine causes influenza, since 33.3% and 27.8% of those not willing to have the vaccine in 2008 cite these as the reason. To raise the staffs concern, the campaigns need to

address the cycle and spread of the influenza virus and the role the HCW's can play in either hastening/ controlling the spread and this can also explain the benefits of the vaccine.

Staff having contact with children ≤five years old and elderly people (≥65 years) either at home or at their place of work can also be targeted by the campaign as they are classified as at risk groups. The influenza A outbreak in 2007 and any future outbreaks of different strains that may occur is also an important factor that may influence staff's future decisions on influenza vaccination and it is worthwhile mentioning it in the campaigns.

REFERENCES

Bryant, K.A., Stover, B., Cain, L., Levine, G.L., Siegel, J. and Jarvis, W.R. 2004. Improving influenza immunisation rates among healthcare workers caring for high-risk pediatric patients. Infection Control and Hospital Epidemiology, 25(11):912-917.

Bull, A.L., Bennett, N., Pitcher, H.C., Russo, P.L. and Richards, M.J. 2007. Influenza vaccine coverage among health care workers in Victorian public hospitals. Medical Journal of Australia, 186(4):185-186.

CDC. 2007. Key Facts About Seasonal Influenza (Flu). Atlanta: Centre for Disease Control and Prevention.

Christini, A.B., Shutt, K.A. and Byers, K.E. 2007. Influenza vaccination rates and motivators among healthcare worker groups. Infection Control and Hospital Epidemiology, 28(2):171-177.

Halliday, L., Thomson, J.A., Roberts, L., Bowen, S. and Mead, C. 2003. Influenza vaccination of staff in aged care facilities in the ACT: how can we improve the uptake of influenza vaccine? Australian and New Zealand Journal of Public Health, 27(1):70-75.

Hofmann, F., Ferracin, C., Marsh, G. and Dumas, R. 2006. Influenza vaccination of healthcare workers: a literature review of attitudes and beliefs. Infection, 34(3):142-147.

McBean, A.M. and Hebert, P.L. 2004. New estimates of influenza-related pneumonia and influenza hospitalizations among the elderly. International Journal of Infectious Diseases, 8(4):227-235.

McCormack, J., and McCall, B. 2008. Influenza vaccination for healthcare workers: towards improving uptake. Healthcare Infection, 13(1). 1-3

McCullers, J.A., Speck, K.M., Williams, B.F., Liang, H. and Mirro, J. 2006. Increased influenza vaccination of healthcare workers at a pediatric cancer hospital: results of a comprehensive influenza vaccination campaign. Infection Control and Hospital Epidemiology, 27(1):77-79.

McKay, I. September 2009. National Notifiable Diseases Surveillance System. Communicable Diseases Intelligence, 33(3). 348-357

Ofstead, C.L., Tucker, S.J., Beebe, T.J. and Poland, G.A. 2008. Influenza vaccination among registered nurses: information receipt, knowledge, and decision-making at an institution with a multifaceted educational program.[see comment]. Infection Control and Hospital Epidemiology, 29(2):99-106.

Piccirillo, B. and Gaeta, T. 2006. Survey on use of and attitudes toward influenza vaccination among emergency department staff in a New York metropolitan hospital. Infection Control and Hospital Epidemiology, 27(6):618-22.

Song, J.Y., Park, C.W., Jeong, H.W., Cheong, H.J., Kim, W.J. and Kim, S.R. 2006. Effect of a hospital campaign for influenza vaccination of healthcare workers. Infection Control and Hospital Epidemiology, 27(6):612-617.

Steiner, M., Vermeulen, L.C., Mullahy, J. and Hayney, M.S. 2002. Factors influencing decisions regarding influenza vaccination and treatment: a survey of healthcare workers. Infection Control and Hospital Epidemiology, 23(10):625-627.

Tapiainen, T., Bar, G., Schaad, U.B. and Heininger, U. 2005. Influenza vaccination among healthcare workers in a university children's hospital.[see comment]. Infection Control and Hospital Epidemiology, 26(11):855-858.

Trivalle, C., Okenge, E., Hamon, B., Taillandier, J. and Falissard, B. 2006. Factors that influence influenza vaccination among healthcare workers in a French geriatric hospital. Infection Control and Hospital Epidemiology, 27(11):1278-1280.

Warwick, A. 2008. Health Care Workers as well as at risk goups must be immunised against influenza to save lives says NHMRC chief. edited by NHMRC: National Health and Medical Research Council.

WHO. 2004. Guidelines for the use of seasonal influenza vaccine inhumans at risk of H5N1 infection. Geneva: WHO.