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Hail Community Acceptance of A/H1N1 Vaccine

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The advent of the 2009 influenza A (H1N1) pandemic in April 2009 made the 2009-10 influenza season highly unusual. Public awareness of the potential seriousness of influenza was heightened by media coverage of pandemic-associated hospitalizations and deaths, especially among younger persons. The aim of our study was to investigate the attitude of Hail population towards this vaccine and possible factors associated with vaccine uptake and the effect of Hail University A/H1N1 awareness campaign conducted during the last pandemic of the disease. Design cross sectional study using self administered, anonymous questionnaires Setting Surveys at Hail University from 2nd of Nov. 2009 to 1st of Jan. 2010. A sample of 363 individuals, 277 males and 86 females from University of Hail students and personnel completed the questionnaire in the study. The overall willingness to accept pre-pandemic A/H1N1 vaccine was only (11.49%) to taking the vaccine while more than half the participants (53.44%) refused to take the vaccine. These ratios were statistically significantly different ($p < 0.001$) of vaccination against the 2009 pandemic influenza among Hail population. The major barriers identified were fear of side effects and doubts about its efficacy. The willingness to accept pre-pandemic influenza vaccination was low and no significant effect was observed with the change in WHO alert level. Further studies are required to elucidate the root cause of the low intention to accept pre-pandemic vaccination.

Key words: A/H1N1, acceptance, awareness, influenza, pandemic diseases, vaccine

INTRODUCTION

The advent of the 2009 influenza A (H1N1) pandemic in April 2009 made the 2009-10 influenza seasons highly unusual (Jaafar-Furo *et al.*, 2008; Sur *et al.*, 2009; Sar *et al.*, 2010; To *et al.*, 2010). Public awareness of the potential seriousness of influenza was heightened by media coverage of pandemic-associated hospitalizations and deaths, especially among younger persons. The mass influenza immunization program initiated in the United States in the fall of 1976 was a unique public health measure in terms of the numbers to be inoculated and the speed with which this was to be accomplished. By the time immunizations were suspended on December 16, more than 40 million doses of vaccine containing either A/New Jersey/8/76 (HswlN1) alone, or A/New Jersey plus A/Victoria/ 3/75 (H3N2) had been given (Poe and Massey, 1977). As of 31 January 2010, worldwide more than 209 countries and overseas territories or communities have reported laboratory-confirmed cases of 2009 pandemic influenza A (H1N1). In addition, at least 15,174 deaths related to this infection have been recorded (WHO, 2009). In Europe, the pandemic is well past its peak and medium intensity transmission is now confined to five countries, all in eastern or south-eastern Europe. One of those countries is Greece, where the recorded number of fatal cases caused by 2009 pandemic influenza is currently 118 (ECDC, 2010). According to recommendations from the World Health Organization (WHO) all countries should immunize their healthcare workers as a first priority in order to protect the vital health infrastructure (WHO, 2010). In Saudi Arabia, a survey carried out among medical consultants covering 60 consultants and medical professors who were selected randomly from Saudi hospitals and medical colleges. The survey focused on the opinions of internists, pediatricians and family doctors. It asked medical experts whether they would take the vaccine, whether they would allow their children to take the vaccine and whether they can convince others of their views. Out of 60 doctors, 52 (80%) said they would not take the vaccine. A similar number of doctors said they would not allow their children to take the vaccine. Only 13 doctors (20%) said they would agree to take the vaccine while 11 (17%) said they would allow their children to take the vaccine. Twenty-five of the 52 doctors who had said they would not take the vaccine said they would advise other people not to take the vaccine. But the remaining doctors said they would not advise others. The second survey covered consultants at clinical pharmacies, dentists and health experts, adding that all of the participants unanimously said that they would not take the vaccine and would not give it to their children.

According to another survey conducted at King Saud University College of Medicine, the bulk of 226 final year medical students opposed taking the vaccine. As many as 198 students (88%) said they would not approve taking the vaccine while 28 students said they would (Crossroad Arabia, 2009). To our knowledge, information on healthcare workers' intention to take up vaccination against the 2009 pandemic influenza is sparse (Chor *et al.*, 2009). Consequently, the aim of our study was to investigate the attitude of Hail University population workers towards this vaccine and possible factors associated with vaccine uptake.

MATERIALS AND METHODS

A structured, self-administered, anonymous questionnaire was distributed to a convenience sample of 363 individuals, 277 males and 86 females from University of Hail students and personnel from 2nd of Nov. 2009 to 1st of Jan. 2010. The survey was conducted on 2nd of Nov. 2009, one week before the official start of national vaccination campaign against the 2009 pandemic influenza A(H1N1) in Saudi Arabia. The questionnaire included questions on demographics, willingness to accept seasonal influenza vaccination and willingness to accept the 2009 pandemic influenza vaccine. In the case of vaccination refusal the participants were requested to define the reason: lack of time, inertia; perception of not being at risk of serious illness, use of alternative drugs and fear about vaccine safety. In the case of fear about vaccine safety, the participant was requested to specify the concern given the following alternatives. Moreover, the target group was asked about their level of information on the safety of pandemic influenza A (H1N1) vaccines (no information/insufficient information, sufficient/very good information) and on their sources of information on influenza A (H1N1) vaccine safety: Internet, family doctors, medical journals/books, television and radio stations, newspapers/magazines, representatives of pharmaceutical companies. Finally, participants were asked to express their opinion on the value of vaccinations as an important means for the protection of public health and in particular of their family members.

RESULTS

As shown in Table 1, the study was conducted on 363 individuals, 277 males and 86 females, most of them (80.44%) are from the students of Hail University. Most of them are not married. The largest proportion of the participants was under twenty years (45.73%, $p < 0.001$).

Table 1: Characteristics of the participants in the questionnaire

Characters of participants	Males		Females		Total		p-value
	No.	%	No.	%	No.	%	
Marital status	277	76.3%	86	23.7%	363	100%	<0.001
Married	42	11.57	19	5.23	61	16.80	0.17
Single	235	64.73	67	18.45	302	83.20	0.54
p-value	p<0.001		p<0.001		p<0.001		
Age							
<20	112	30.85	54	14.87	166	45.73	0.007
20-29	128	35.26	17	4.68	145	39.94	<0.001
30-49	34	9.36	10	2.75	44	12.12	0.88
50-59	3	0.83	5	1.37	8	2.20	0.03
p-value	p<0.001		p<0.001		p<0.001		
Level of education							
Less than high school	0	0	1	0.27	1	0.27	0.07
High school	21	5.78	9	2.47	30	8.26	0.41
College	219	60.33	64	17.63	283	77.96	0.67
Postgraduate	37	10.19	12	3.30	49	13.49	0.89
p-value	p<0.001		p<0.001		p<0.001		
Work in health care							
No	232	63.91	53	14.60	285	78.51	0.04
Yes	45	12.36	33	9.09	78	21.48	<0.001
p-value	p<0.001		p = 0.03		p<0.001		
Position in Hail Univ.							
Student	227	62.53	65	17.91	292	80.44	0.55
Faculty member	39	10.74	17	4.68	56	15.42	0.24
Administrator	6	1.65	4	1.10	10	2.75	0.22
Labour	1	0.27	0	0 (0)	1	0.27	0.57
Other	4	1.10	0	0 (0)	4	1.10	0.26
p-value	p<0.001		p<0.001		p<0.001		

With respect to the level of education, most of the participants were universally educated or postgraduate studies (91.45%, p<0.001). Most of the participants were not working in health field (78.51%, p<0.001).

The first question asked was did you hear about the disease? The result was highly significant (p<0.001) since 97.79% of the participants heard about the swine flu disease. With respect to the symptoms of the disease, 57.30% of the participants answered yes, 9.36% answered No while the rest of them (33.33%) answered little meaning that they have little information about the symptoms of the disease. About the mode of infection, 67.76% said that the infection is transmitted through the air. In the same time, 70.24% said that infection transmits through dealing with the patients whereas 42.69% said that use of the patient tools is the cause of infection. These proportions were statistically significant (p<0.001). With respect to the danger of the disease, 55.37% said that the disease is dangerous, 26.72% said that the disease is very dangerous while 14.87% said that the disease is not dangerous (p<0.001). The treatment of the disease was controversial in such a way that 43.25% said that the antiviral agents are the optimal treatment for the disease while 19.01% said that the treatment is the antibiotics. A small proportion of the participants (15.70%) said that the disease has no treatment (p<0.001). With respect to the

precautions must be taken to avoid the disease, 75.77% said that avoiding the patient is the most important precaution while 56.74% said that washing the hand is the precaution of choice, others (55.37%) said that wearing of mask is more important (p<0.001). What population of people may be at risk?. A question answered by the participants as follows: a ratio of 71.91% answered that children are the population of choice while 35.26% said that pregnant are mostly subjected to the disease whereas 11.02% only said that adults are the high risk population. In addition, 44.62% said that elders are more subjected to the disease due to their weak immunity. Finally, a ratio of 13.22% said that they don't know exactly who the persons at high risk for the disease are. About worrying from the disease, about half the participants (50.13%) said that they not worried while those who are worried were 37.46% and very worried were 12.39% of the participants. With respect to the information about the disease, media were the major source of information for most of the participants (88.71%) while the other sources recorded nearly equal ratios; friends (15.15%), university (19.55%), family (15.42%). All these ratios were statistically significant (p<0.001, Table 2).

The first question directed to the participants was Do you know that there is a vaccine for the swine flu?. Of course, the majority of them (94.49%) answered yes

Table 2: Questions about the swine flu disease

Question	Answers	Males		Females		Total		p-value
		No.	%	No.	%	No.	%	
Did you hear about the swine flu?	Yes	270	74.38	85	23.41	355	97.79	0.90
	No	7	1.92	1	0.27	8	2.20	0.41
	p-value	<0.001		<0.001		<0.001		
Do you know the symptoms of swine flu?	Yes	138	38.01	7000.00%	19.28	208	57.30	0.001
	No	34	9.36	0.00%	0	34	9.36	0.001
	Little	105	28.92	16	4.41	21	33.33	0.005
	p-value	<0.001		<0.001		<0.001		
How transmission of infection occurs?	Through air	187	51.51	59	16.25	246	67.76	0.91
	Contact with patients	201	55.37	54	14.87	255	70.24	0.37
	Use of infected tools	115	31.68	40	11.02	155	42.69	0.57
	Blood transfusion	39	10.74	17	4.68	56	15.42	0.21
	p-value	<0.001		<0.001		<0.001		
What do you think the seriousness of the disease?	Not dangerous	40	11.02	14	3.85	54	14.87	0.75
	Dangerous	149	41.04	52	14.32	201	55.37	0.51
	Very dangerous	77	21.21	20	5.51	97	26.72	0.47
	I don't know	11	3.03	0.00%	0	11	3.03	0.04
	p-value	<0.001		<0.001		<0.001		
What is the treatment of the disease?	Antiviral agents	113	31.13	44	12.12	157	43.25	0.18
	Antibiotics	56	15.42	13	3.58	69	19.01	0.39
	No treatment	54	14.87	3	0.83	57	15.70	0.001
	I don't know	81	22.31	29	7.98	11	30.30	0.50
	p-value	<0.001		<0.001		<0.001		
What are the precautions to avoid the disease?	Avoid the patients	205	56.47	70	19.28	275	75.75	0.47
	Hand washing	143	39.39	63	17.35	206	56.74	0.02
	Wear masks	153	42.14	48	13.22	201	55.37	0.94
	I don't know	10	2.75	0	0%	10	2.75	0.07
	p-value	<0.001		<0.001		<0.001		
Who persons may be at risk?	Children	186	51.23	75	20.66	261	71.91	0.06
	Pregnants	81	22.31	47	12.95	128	35.26	0.001
	Adults	33	9.09	7	1.93	40	11.02	0.35
	Elders	115	31.68	47	12.94	162	44.62	0.001
	I don't know	45	12.39	3	0.83	48	13.22	0.003
	p-value	<0.001		<0.001		<0.001		
Are you worried about the disease?	Unworried	124	34.16	58	15.97	182	50.13	0.008
	Worried	111	30.57	25	6.88	136	37.46	0.16
	Very worried	42	11.57	3	0.83	45	12.39	0.005
	p-value	<0.001		<0.001		<0.001		
What is your source of information about the disease?	University	44	12.12	27	7.43	71	19.55	0.005
	Media	246	67.76	76	20.93	322	88.71	0.96
	Family	43	11.84	13	3.58	56	15.42	0.92
	Friends	39	10.74	16	4.41	55	15.15	0.34
	Family physician	16	4.41	8	2.20	24	6.61	0.34
	p-value	<0.001		<0.001		<0.001		

whereas, a very small proportion (5.51%) answered No ($p < 0.001$, Table 3). With respect to the usefulness of the vaccine, 20.11% only said that it is useful, while 34.74% said that the vaccine is useless whereas 42.42% selected the choice of I don't know ($p < 0.001$, Table 3). With respect to the possible danger due to taking the vaccine, 45.45% of the participants said that the vaccine is dangerous while 12.12% only said that the vaccine may be not dangerous whereas a ratio of 42.42% said I don't know ($p < 0.001$, Table 3). About the knowledge of the participants with the vaccine, 85.39% had their information from media, 19.56% from friends, 22.58% from family and finally 6.33% from the family physician ($p < 0.001$). The crucial question was Do you accept to take the vaccine? A very little ratio of the participants (11.49%) accepted taking the vaccine while more than half the

participants (53.44%) refused taking the vaccine. The rest of the participants (35.26%) said that they did not decide yet. These ratios were statistically significantly different ($p < 0.001$, Table 3). The role of media in raising awareness of the participants about the disease and the vaccine was enough in the opinion of 53.16% of the participants while 31.40% said that the role of media was not enough whereas the rest (15.42%) were neutral for this question. These ratios were varied significantly ($p < 0.001$). With respect to the effect of media on the decision to take the vaccine, a total of 57.84% said the media were effective (38.01%) or very effective (19.83%) while 34.16% said that media were not effective whereas the rest (9.09%) of the participants were neutral for this question ($p < 0.001$, Table 3). About the impact of the community on the decision to take the vaccine, 59.23% said the community

Table 3: Questions about the vaccine of swine flu disease

Question	Answers	Males		Females		Total		p-value
		No.	%	No.	%	No.	%	
Do you know that there is a vaccine for swine flu?	Yes	257	70.79	86	23.69	343	94.49	0.52
	No	20	5.51	0	0.00	20	5.51	0.009
	p-value	<0.001		<0.001		<0.001		
Do you think that the vaccine is useful?	Useful	56	15.42	17	4.68	73	20.11	0.89
	Useless	103	28.37	34	9	137	37.74	0.84
	I don't know	118	32.51	35	9.64	153	42.14	0.85
	p-value	<0.001		= 0.02		<0.001		
Do you think that there is a risk when you take the vaccine?	Useful	115	31.68	50	13.77	165	45.45	0.04
	Useless	37	10.19	7	1.92	44	12.12	0.21
	I don't know	125	34.43	29	7.98	154	42.42	0.15
	p-value	<0.001		<0.001		<0.001		
What is your source of formations about the vaccine?	Media	233	64.18	77	21.21	310	85.39	0.64
	Family	53	14.60	29	7.98	82	22.58	0.01
	Friends	44	12.12	27	7.43	71	19.56	0.005
	Family physician	14	3.85	9	2.48	23	6.33	0.08
	p-value	<0.001		<0.001		<0.001		
Do you accept to take the vaccine?	Yes	35	9.64	6	1.65	41	11.49	0.22
	No	137	37.74	57	15.70	194	53.44	0.06
	Not decided yet	105	28.92	23	6.33	128	35.26	0.14
	p-value	<0.001		<0.001		<0.001		
Do you think that the role of media awareness about the disease and the vaccine is enough?	Yes	148	40.77	45	12.39	193	53.16	0.86
	No	87	23.96	27	7.43	114	31.40	<0.001
	I don't know	42	11.57	14	3.86	56	15.42	0.88
	p-value	<0.001		<0.001		<0.001		
To what extent the media has influenced your decision to take the vaccine?	Influential	109	30.02	29	7.98	138	38.01	0.42
	Very influential	56	15.42	16	4	72	19.83	0.78
	Not influential	91	25.06	33	9.09	124	34.16	0.39
	I don't know	21	5.28	8	2.20	29	7.98	0.69
	p-value	<0.001		<0.001		<0.001		
What is the impact of the community around you to take the vaccine?	Influential	95	26.17	29	7.98	124	34.16	0.91
	Very influential	77	21.21	14	3.85	91	25.07	0.06
	Not influential	78	21.48	33	9.09	111	30.57	0.11
	I don't know	27	7.43	10	2.75	37	10.19	0.7
	p-value	<0.001		<0.001		<0.001		
Is there a political or an economic dimension to take the vaccine?	Yes	105	28.92	32	8.81	137	37.74	0.92
	No	49	13.49	8	2.20	57	15.70	0.08
	I don't know	123	33.88	46	12.67	169	46.55	0.27
	p-value	<0.001		<0.001		<0.001		
Is there an impact on your decision to take the vaccine when required to sign a consent?	Yes	121	33.33	26	7.16	147	40.49	0.08
	No	81	22.31	32	8.81	113	31.13	0.27
	I don't know	75	20.66	28	7.71	103	28.37	0.35
	p-value	p<0.001		p = 0.72		p = 0.01		

was effective (34.16%) or very effective (25.07%). A ratio of 34.16% said that the community was not effective while the rest (10.19%) was neutral ($p < 0.001$, Table 3). With respect to the presence of a political or economic dimension about taking the vaccine, 37.74% answered Yes, 15.70% answered No while nearly half the participants (46.55%) said I don't know. these ratios were significantly different ($p < 0.001$, Table 3). Consent must be taken from the participant before taking the vaccine. This consent was one of the effective reasons led to the rejection of the vaccine where 40.49% of the participants said that the consent was affecting their decision to take the vaccine. On contrary, a ratio of 31.13% said that the consent was not effective while the rest of the participants were neutral (28.37%). All these ratios were significantly different ($p < 0.001$, Table 3).

Table 4 shows the main reasons for rejection of taking the vaccine. These reasons can be summarized in the probable danger and the doubt usefulness and the consent before taking the vaccine. For the danger of the vaccine, 45.45% of the participants said that the vaccine is dangerous and so they refuse to take. With respect to the usefulness of the vaccine, only 20.11% said that it is useful and the vast majority said that it is not useful or with doubtful benefit and so they refuse the vaccine for this reason. The consent taken before vaccination was one of the most reasonable causes of rejection because it confirmed the dangerous effect of taking the vaccine. A ration of 40.49% of the participants confirmed that the consent had a strong impact on their decision to take the vaccine.

Table 4: Association between the acceptance or rejection of taking vaccine and some important other questions

Question	Answer	Do you accept to take the vaccine?			Total	p-value
		Yes	No	Not decided		
Do you think that the vaccine is dangerous?	Yes	7	137	21	165	<0.001
		1.92%	37.74%	5.78%	45.45%	
	No	26	8	10	44	<0.001
		7.16%	2.20%	2.75%	12.12%	
	I don't know	8	49	97	154	<0.001
		2.20%	13.49%	26.72%	42.42%	
Do you think that the vaccine is useful?	Total	41	194	128	363	<0.001
		11.29%	53.44%	35.26%	100%	
	p-value	<0.001	<0.001	<0.001	<0.001	
	Useful	31	21	21	73	0.25
		8.53%	5.78%	5.78%	20.11%	
	Useless	3	113	21	137	<0.001
Is there an impact on your decision to take the vaccine when required to sign a consent?		0.82%	31.13%	5.78%	37.74%	
	I don't know	7	60	86	153	<0.001
		1.92%	16.52%	23.69%	42.14%	
	Total	41	194	128	363	<0.001
		11.29%	53.44%	35.26%	100%	
	p-value	<0.001	<0.001	<0.001	<0.001	
Is there an impact on your decision to take the vaccine when required to sign a consent?	Yes	12	78	57	147	<0.001
		3.31%	21.48%	15.70%	40.49%	
	No	19	74	20	113	<0.001
		5.23%	20.38%	5.51%	31.13%	
	I don't know	10	42	51	103	<0.001
		2.75%	11.57%	14.05%	28.37%	
Is there an impact on your decision to take the vaccine when required to sign a consent?	Total	41	194	128	363	<0.001
		11.29%	53.44%	35.26%	100%	
	p-value	0.19	0.2	<0.001	1.00	

DISCUSSION

Present study revealed a low acceptance from the participants (11.49%) to taking the vaccine while more than half the participants (53.44%) refused taking the vaccine. The rest of the participants (35.26%) said that they did not decide yet. These ratios were statistically significantly different ($p < 0.001$, Table 3) of vaccination against the 2009 pandemic influenza among Hail population. There is some evidence that the willingness of Saudi healthcare workers to be vaccinated with seasonal influenza vaccine is slightly high (20%) 6 comparing to the European healthcare workers to be vaccinated with seasonal influenza vaccine which ranging from 14% in the United Kingdom to the very high (48%) among French (NSIVSE., 2007). In a Canadian qualitative study among health care professionals and the general public, the authors found that individuals were hesitant to accept pandemic vaccines and that concerns about using new vaccines during a pandemic differ from concerns about using established products in non-crisis situations (Sencer and Millar, 2009). In France, studies conducted by Schwarzingler *et al.* (2010) found that acceptability of A/H1N1 pandemic vaccination was as low as 17.0% among the French adult population and concerns about A/H1N1 pandemic vaccine safety were the main reason quoted by 71.2% respondents who denied being vaccinated. To *et al.* (2010) found that only 13.3% of the respondents planned to receive the H1N1 vaccine,

compared with 37.5% for the seasonal influenza vaccine. Vaccination against seasonal influenza in the preceding season strongly predicted the likelihood of H1N1 vaccination. In Addition, Eastwood *et al.* (2010) found in Australia that of 1155 possible participants, 830 (72%) were successfully interviewed. Twenty percent of the study group (169/830) reported that they had developed influenza-like symptoms during the 2009 pandemic period. Most respondents (645/830, 78%) considered pandemic (H1N1) 2009 to be a mild disease and 211/830 (25%) regarded themselves as being at increased risk of infection. Willingness to accept pandemic (H1N1) 2009 vaccination was high (556/830, 67%) but was significantly lower than when pandemic vaccination uptake was investigated in 2007 (88%; $p < 0.0001$). Respondents who had already been vaccinated against seasonal influenza and those who perceived pandemic (H1N1) 2009 to be severe were significantly more willing to accept vaccination. Most respondents (793/822, 96%) were willing to share surplus vaccine with developing countries in our region. Finally, in Canada, Dubre *et al.* (2010) found that 72% and 92% of 921 questionnaires agreed with the statements regarding vaccine safety, effectiveness and acceptability. More than 75% of respondents intended to recommend the A (H1N1) pandemic influenza vaccine to their patients and to get vaccinated themselves.

Present results primarily suggest that the general population was not reassured that A/H1N1 pandemic

vaccines were safe. It calls into question the information received by the general population at time of the survey and what factors may have worsened the perception that A/H1N1 pandemic vaccines are unsafe. On the one hand, the severity of A/H1N1 2009 influenza illness was stressed by daily reports of fatalities in the news media, frequent messages from public health authorities and personal appearances in the media of the Ministry of Health and the awareness campaign conducted by Hail University in order to motivate people's compliance with the mass vaccination campaign. On the other hand, the safety of A/H1N1 pandemic vaccines was scrutinized by the media and public websites discussion boards with regard to the risk of Guillain-Barre' syndrome, the limited knowledge about the vaccines accounting for almost all doses available in Saudi Arabia, the accelerated authorization procedure to market pandemic vaccines and the actual motivations of pharmaceutical firms, while the unclear number of vaccine injections called their protective efficacy into question.

CONCLUSION

The low acceptance rate of the pandemic vaccine among Hail population is alarming given that they are not clearly educated by their health providers because the researches revealed that health workers have been used as an example for their patients and the public (ECDC, 2009). Vaccination is important in order to keep the healthcare system operating at maximum capacity during a pandemic (Jordan and Hayward, 2009). Policy makers in Saudi Arabia and maybe in other countries in EMRO could consider our findings in order to improve the vaccination strategy for healthcare workers in future vaccination campaigns. In addition, our study shows that the implementation of a mass vaccination campaign and the particular role given to primary care physicians were major factors to achieve a successful pandemic vaccination campaign.

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