

## **Knowledge and Practice among the Population of Saudi Arabia Eastern Province during the H1N1 Pandemic 2009**

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**Background:** It is well-known that public compliance with health directives is a prerequisite for an effective pandemic management and that individual beliefs, perceptions and knowledge are important factors in determining this compliance.

**Objective:** To evaluate the level of people's knowledge and practice towards Influenza A (H1N1pandemic).

**Design:** A descriptive cross-sectional study.

**Setting:** Five commercial malls, Eastern Province, Saudi Arabia.

**Method:** Self-administered questionnaires which were distributed among 550 adults attending specific commercial malls in Eastern Province from 27<sup>th</sup> of June to 11<sup>th</sup> of July 2009.

**Result:** A total of 550 adults participated in this study. Five-hundred twenty-seven (95.8%) participants were Saudi and 286 (52%) were males.

Five-hundred forty-seven (99.5%) participants heard about "swine flu". Five-hundred thirty-eight (97.8%) knew that this disease is transmissible to humans. Four-hundred eighty-six (88.4%) thought that the disease can be prevented. Three-hundred nine (56.2%) participants stated that there is a vaccine against the disease.

Two-hundred thirty-six (42.9%) stated that they were washing their hands and the same figure stated that they were avoiding people with seasonal influenza symptoms. Moreover, only ninety (16.4%) stopped kissing and hugging friends and relatives and 68 (12.4%) stopped shaking hands.

**Conclusion:** Although the knowledge of the people in Eastern Province in KSA about Influenza A (H1N1) was good, poor compliance with the government recommended preventive measures was noted. This study proved that there is a need for more efforts to encourage the public to undertake specific behaviours related to preventive measures of infectious diseases outbreaks.

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Seasonal influenza is one of the most important causes of high morbidity and mortality in communities (epidemic) and worldwide (pandemic). Combined with pneumonia, influenza is one of the ten leading causes of death in United States<sup>1</sup>.

Annual influenza epidemics pose a threat to 5-15% of the world population, about 3-5 million cases of severe illness and a quarter to half a million deaths worldwide<sup>2</sup>.

In April 2009, the first case with influenza-like illness was first reported in Mexico, which subsequently confirmed to be a new strain of influenza A (H1N1) commonly referred to as “swine flu”<sup>3-5</sup>. Since then, the virus has spread rapidly throughout the world, which led the WHO to quickly raise the level of influenza pandemic alert from phase 5 to 6<sup>6-9</sup>. In June 2010 more than 214 countries reported laboratory confirmed cases of the novel virus causing over 18,172 deaths<sup>10</sup>.

The WHO has developed guidelines which included measures for identifying, treating and isolating people who have acquired the disease and urged the member states to develop a national pandemic influenza plan to prevent the spread of Influenza A (H1N1) virus<sup>11</sup>. The national plan should include measures for public health interventions such as encouragement of personal hygiene, washing hands regularly with soap and water, covering nose and mouth during sneezing and coughing and wearing face mask<sup>11</sup>.

It is well-known that public compliance with health directives is a prerequisite for an effective pandemic management and that individual beliefs, perceptions and knowledge are important factors in determining this compliance<sup>12-14</sup>.

Previous experiences during the Severe Acute Respiratory Syndrome (SARS) epidemic have shown that lack of knowledge of disease transmission and prevention had increased the risk of non-compliance with the recommended guidelines<sup>15</sup>. It was also reported that improving the knowledge of disease transmission, prevention and encouraging the public to undertake specific behaviors related to hygiene could influence the efficacy of preventive measures and it is a useful public health strategy in containing previous outbreaks of infectious disease<sup>15-18</sup>.

In the Kingdom of Saudi Arabia (KSA), the first confirmed case of swine flu was on the 3rd of June 2009<sup>19</sup>. KSA government has responded to the epidemic utilizing the mass media, such as TV, newspapers and internet to disseminate the information on preventive measures. The Ministry of Health (MOH) established a National Scientific Committee to deal with all rising concerns of the epidemic. The national committee was able to provide comprehensive information, advice and educational materials on the signs and symptoms of H1N1b which were distributed to different locations in the kingdom including shopping malls, mosques, airports and schools<sup>19</sup>.

Although many preventive measures were taken by the KSA government, there is a need to assess these efforts in the community, which would assist the health care management to

identify any knowledge gaps and to ensure the preparedness of the public in facing new epidemic of influenza or any other new emerging disease.

The aim of this study is to assess the level of knowledge and practice toward Influenza A (H1N1) among the population of the Eastern Province of KSA.

## METHOD

Five commercial malls were selected to conduct the study (Al Rashid Mall, Dhahran Mall, Al Shat'a Mall, Marina Mall and Qatif City Mall).

A convenient sample of adults of both sex, over the age of 18 years who attended these malls during the study period from 27 June to 11 July 2009, were asked to participate in the study. One hundred participants were recruited from each mall, except Al Rashid mall where 150 participants were recruited. Saudi and non-Saudi subjects were included.

A self-administered questionnaire was designed to be used as a data collection tool. The following items were collected for each participant:

- Personal characteristics such as gender, age, education, occupation and nationality.
- Knowledge about the disease, its nature, mode of transmission, symptoms and signs, incubation period, period of communicability and preventive measures.
- Practice of each participant as precautionary measures since the beginning of the pandemic.
- Impact of the disease on the participants and their daily activities.

Data entry and statistical analysis were performed using SPSS version 15.0.

Verbal consent was taken from each participant after explaining the study and its objectives.

## RESULT

A total of 550 subjects participated in this study. Five-hundred twenty-seven (95.8%) participants were Saudi, and 286 (52%) were males. Two hundred forty-seven (44.9%) participants were between the ages of 20-30 years, followed by 134 (24.4%) participants in the age group 31-40 years. Two hundred ninety-eight (54.2%) participants were married, while 234 (42.5%) were single, divorced 10 (1.8%) and widowed 8 (1.5%). Two hundred ninety-one (52.9%) were working, while 163 (29.6%) were students, see table 1.

**Table 1: Personal Characteristics of Participants**

Variable Items	Response Number (Percentage)
<b>Nationality</b>	
Saudi	527 (95.8)
Non Saudi	23 (4.2)
Total	550
<b>Age</b>	
<20	101 (18.4)
20 - 30	247 (44.9)
31 - 40	134 (24.4)
>40	68 (12.3)

Total	550
Sex	
Male	264 (48)
Female	286 (52)
Total	550
<b>Marital Status</b>	
Married	298 (54.2)
Single	234 (42.5)
Divorced	10 (1.8)
Widowed	8 (1.5)
Total	550
<b>Educational Level</b>	
Less than high School	59 (10.7)
High School	174 (31.6)
Academic	281 (51.1)
Diploma	24 (4.4)
Other	12 (2.2)
Total	550
<b>Job</b>	
Working	291 (52.9)
Not Working	57 (10.4)
Student	163 (29.6)
Housewife	39 (7.1)
Total	550

**Table 2: General Knowledge of People about Influenza A H1N1**

Variable Items	Response Number & Percentage	
	Yes	No
Hearing about influenza A H1N1	547 (99.5%)	3 (0.5%)
Following the countries where the disease has spread	368 (66.9%)	182 (33.1%)
Transmissible to humans	538 (97.8%)	12 (2.2%)
Transmissible through contacts with infected people in <1m	432 (78.5%)	118 (21.5%)
The symptoms of influenza A H1N1 are the same general symptoms of seasonal influenza	357 (64.9%)	193 (35.1%)
Reading about prevention from influenza A H1N1	347 (63.1%)	203 (36.9%)
It could be prevented	486 (88.4%)	64 (11.6%)
vaccination against influenza A H1N1	309 (56.2%)	241 (43.8%)

Five hundred forty-seven (99.5%) participants had heard about “swine flu”; and 368 (66.9%) were following the news of the countries where the disease had spread. Five hundred thirty-eight (97.8%) knew that this disease is transmissible to humans, 432 (78.5%) were aware that the disease can be transmitted through contact with infected people in a distance of less than one meter. Three hundred fifty-seven (64.9%) thought that “swine flu” has the same symptoms of a seasonal influenza. Three hundred forty-seven (63.1%) had read about preventive measures for influenza A (H1N1) and 486 (88.4%) thought that the disease could be prevented. Three hundred nine (56.2%) participants stated that there is a vaccine against the disease, see table 2.

Two hundred thirty-six (42.9 %) stated that they were washing their hands and the same figure stated that they were avoiding people with seasonal influenza symptoms. Moreover, only ninety (16.4%) stopped kissing and hugging friends and relatives and 68 (12.4%) stopped shaking hands. Two hundred three (36.9%) had the intention to isolate themselves or their family members if they get the disease and 163 (29.6%) started to avoid crowded places, such as airports and malls. Eighty (14.5%) stated that they were wearing protective mask and 70 (12.7%) bought antiviral as protective measures for influenza, see table 3.

**Table 3: Practice of People to Avoid Influenza A H1N1**

Variable Items	Response Number & Percentage	
	Yes	No
Washing your hand more often than before	236 (42.9%)	314 (57.1%)
Decided to avoid people with seasonal flu symptoms	236 (42.9%)	314 (57.1%)
Stopped kissing and hugging your friends and relatives	90 (16.4%)	460 (83.6%)
Stopped shaking hands to prevent transmission of influenza A H1N1	68 (12.4%)	482 (87.6%)
Having the intention to isolate yourself or a family member when you catch influenza A H1N1	203 (36.9%)	347 (63.1%)
Avoiding crowded places such as airports, malls and public transport	163 (29.6%)	387 (70.4%)
Wearing a protective mask	80 (14.5%)	470 (85.5%)
Buying anti-viral drugs	70 (12.7%)	480 (87.3%)
Avoiding people coming from affected countries recently	193 (35.1%)	357 (64.9%)

Two-hundred sixty (47.3%) participants stated that their plans to travel had been affected by the pandemic. Seventy-seven (14%) of those who had relatives studying outside Saudi Arabia came back because of the pandemic and only 24 (4.4%) who had to travel outside Saudi Arabia for business cancelled their travel because of the pandemic. Two-hundred ninety-five (53.6%) participants were worried about themselves and their families to be infected by this virus in the coming period, see table 4.

**Table 4: Impact of Influenza A H1N1 on People**

Variable Items	Response Number (Percentage)	
	Yes	No
Effect of influenza A H1N1 on your plans for travel this summer	260 (47.3%)	290 (52.7%)
Effect of influenza A H1N1 on your relative who is studying abroad	77 (14%)	473 (86%)
Effect of influenza A H1N1 on your business in countries where it has emerged	24 (4.4%)	526 (95.6%)
Worry about being infected or one of your family member during this year	295 (53.6%)	255 (46.4%)

## DISCUSSION

The overall participant's knowledge about Influenza A (H1N1) virus, mode of transmission and preventive measures was found to be excellent.

Age and level of education can play a role in determining behavioral changes. In a study in the United Kingdom, Rubin et al found that younger age was related to better behavioral changes in relation to the Swine Flu outbreak<sup>20</sup>. However, during Severe Acute Respiratory Syndrome (SARS), several studies found that older age group is more likely to take action; on

the other hand, Leung et al found that young, less-educated males were the least likely to take precautionary measures<sup>13,16,17,21-23</sup>.

These factors may play a role in our study which include the majority of young educated Saudi who showed a good knowledge but average practice.

Several studies showed distinct regional differences toward behavioral responses to Influenza A (H1N1)<sup>24-26</sup>. Our study findings did not differ from previous Saudi studies regarding the behavioral responses to Influenza A (H1N1)<sup>19</sup>.

It is known that Influenza A (H1N1) is easily transmitted from person to person. Therefore, practicing good personal hygiene is useful in containing the outbreak of the disease<sup>27</sup>. Hand washing is an important practice in reducing the transmission of upper respiratory tract infections<sup>28,29</sup>. This study found that good knowledge for hand washing was not related to better hand washing practices. Despite that 97.8% were aware that that this disease is transmissible to humans, only 42.9% stated that they were washing their hands. This finding is not similar to other studies, which revealed that that good knowledge of hand washing is directly proportional to hand washing practices<sup>19,30</sup>.

It is well known that the level of knowledge will determine the attitudes and practices in influenza risk reduction. Leung et al found that better knowledge equate with better adoption of precautionary practices<sup>14</sup>.

Social distancing has been recommended during pandemic phase, as it is reported to be a very practical and feasible option to contain the spread of the Influenza A (H1N1) and serves as a good indicator for pandemic preparedness and awareness<sup>31-33</sup>. Those individuals who were aware that the disease can spread easily may proactively practice social distancing<sup>34</sup>. In our study, although the majority of the participants were aware that Influenza A (H1N1) can be transmitted from person to person, 42.9% stated that they were avoiding people with seasonal influenza symptoms; only 16.4% stopped kissing and hugging friends and relatives, 12.4% stopped shaking hands and 29.6% started to avoid crowded places. These findings do not concur with several studies that reported that knowledge score predicts the practice<sup>12,18</sup>. Also, these figures indicate a negative impact on KSA preparedness for any future pandemics.

## CONCLUSION

**Although the knowledge of the people in Eastern Province in KSA about Influenza A (H1N1) was good, poor compliance with the government recommended preventive measure was noted.**

**This study proved that there is a need for more efforts to encourage the public to undertake specific behaviours related to preventive measures of infectious diseases outbreaks.**

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