KNOWLEDG AND PROTECTIVE BEHAVIORS OF STAFF NURSES TOWARDS INFLUENZA PPANDEMIC AT HEALTH CARE SETTIINGS OF NEPAL

Mr. Ramesh Neupane

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ความรู้และพฤติกรรมการป้องกันของบุคลากรทางการพยาบาลในการระบาดของโรคไข้หวัดใหญ่ ที่ปฏิบัติงานในสถานบริการสาธารณสุข ประเทศเนปาล

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วิทยานิพนธ์เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
สาขาวิชาสาธารณสุขศาสตร์
วิทยาลัยวิทยาศาสตร์สาธารณสุข จุฬาลงกรณ์มหาวิทยาลัย
ปีการศึกษา 2554

Thesis Title	KNOWLEDGE AND PROTECTIVE BEHAVIOR OF STAFF NURSES TOWARDS INFLUENZA PANDEMIC AT HEALTH CARE SETTINGS OF NEPAL
By	Mr. Ramesh Neupane
Field of Study	Public Health
Thesis Advisor	Assistant Professor Ratana Somrongthong, Ph.D.

Accepted by the College of Public Health Sciences, Chulalongkorn University in Partial Fulfillment of the Requirements for the Master's Degree

……..... Dean of the College of Public Health Sciences

(Professor Surasak Taneepanichskul, M.D.)

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……..... Chairman

(Robert Sedgwick Chapman, M.D., M.P.H.)

……..... Thesis Advisor

(Assistant Professor Dr. Ratana Somrongthong, Ph.D.)

……..... External Examiner

(Dr. Karankgrai Lerdthusnee, Ph.D.)

นายราเมฆ นูเพน : ความรู้และพฤติกรรมการป้องกันของบุคลากรทางการพยาบาลในการระบาดของโรคไข้หวัดใหญ่ที่ปฏิบัติงานในสถานบริการสาธารณสุข ประเทศเนปาล (KNOWLEDGE AND PROTECTIVE BEHAVIORS OF STAFF NURSES TOWARDS INFLUENZA PANDEMIC AT HEALTH CARE SETTING OF NEPAL) อ.ที่ปรึกษา ผศ.ดร.รัตนา สำโรงทอง, 108 หน้า

การให้การพยาบาลในช่วงที่มีการระบาดของไข้หวัดใหญ่ พยาบาลจำเป็นต้องมีความรู้ ความเข้าใจในเรื่องอาการ การติดต่อและการป้องกันโรค การศึกษาครั้งนี้มีวัตถุประสงค์เพื่อเปรียบเทียบความรู้และพฤติกรรมการป้องกันโรคของพยาบาลในโรงพยาบาล ณ เมืองจิตตวัน และกาฐมันฑุ ประเทศเนปาล

การศึกษาครั้งนี้เป็นการศึกษาเชิงปริมาณ ภาคตัดขวาง ในโรงพยาบาล ณ เมืองจิตตวัน และกาฐมันฑุ ประเทศเนปาล ระหว่างเดือนกุมภาพันธ์ถึงกลางเดือนมีนาคม 2012 ในกลุ่มพยาบาลของโรงพยาบาลในสองพื้นที่ที่เลือกแบบเฉพาะเจาะจง อันได้แก่ เมืองจิตตวัน และกาฐมันฑุ โดยการสุ่มโรงพยาบาลแบบมีระบบจาก 5 โรงพยาบาล จากเมืองจิตตวัน และ 5 โรงพยาบาล จากเมืองกาฐมันฑุ เก็บข้อมูลการสัมภาษณ์พยาบาลจำนวน 424 คน โดยการสุ่มแบบง่ายเก็บข้อมูลโดยใช้แบบสอบถามที่ผู้วิจัย สร้างขึ้นมา การวิเคราะห์ทางสถิติ โดยใช้ โปรแกรม SPSS (16) สถิติที่ใช้ได้แก่ chi square และ student t-test โดยมีนัยสำคัญทางสถิติที่ p value <.05

ผลการศึกษาพบว่า จากกลุ่มตัวอย่าง จำนวน 424 คน ร้อยละ 32.1 ทำงานที่เมืองกาฐมันฑุ และ ร้อยละ 47.2 ทำงานที่เมืองจิตตวัน มีความรู้เรื่องโรคระบาดไข้หวัดใหญ่ระดับต่ำ และพบว่า ร้อยละ 67.9 ทำงานที่เมืองกาฐมันฑุ และร้อยละ52.8 ทำงานที่เมืองจิตตวัน มีความรู้เรื่องโรคระบาดไข้หวัดใหญ่ระดับดี ซึ่งพบว่าระดับความรู้และพื้นที่ทำงาน มีความแตกต่างอย่างนัยสำคัญทางสถิติที่ p value

0.004 และพบว่า พื้นที่ทำงานและประวัติของบริการผู้ป่วยในช่วงที่มีการระบาดของโรคไข้หวัดใหญ่มีผลต่อคะแนนความรู้ p value < 0.05 กลุ่มตัวอย่างร้อยละ 45.9 เคยบริการผู้ป่วยโรคไข้หวัดใหญ่ (ร้อยละ 73.1 ที่เมือง กาฬมันฑุ และร้อยละ18.9 ที่เมืองจิตตวัน) ในเรื่องพฤติกรรมการป้องกันโรคของพยาบาล มีเพียงร้อยละ 16.1 ที่เมืองกาฬมันฑุ และ ร้อยละ19.6 ที่เมืองจิตตวัน มีพฤติกรรมการป้องกันโรคอยู่ในระดับดี ผลการศึกษาสรุปได้ว่าพยาบาลที่ทำงานที่เมืองกาฬมันฑุ มีระดับความรู้และพฤติกรรมการป้องกันโรค ดีกว่าพยาบาลที่ทำงานที่เมืองจิตตวัน (ความรู้ ร้อยละ 29.2 : ร้อยละ 27.0 และพฤติกรรมการป้องกันโรค ร้อยละ 21.0 : ร้อยละ 20.5) ตามลำดับ จากผลการศึกษาควรให้ความรู้อย่างเข้มข้นในเรื่องพฤติกรรมการป้องกันโรค รวมทั้งการจัดหาให้มีอุปกรณ์ที่ใช้ในการป้องกันโรคอย่างเพียงพอ

สาขาวิชา สาธารณสุขศาสตร์ ลายมือชื่อนิสิต .....

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KNOWLEDGE AND PROTECTIVE BEHAVIOR OF STAFF NURSES TOWARDS INFLUENZA PANDEMIC AT HEALTH CARE SETTINGS OF NEPAL ADVISOR: ASST.PROF. RATANA SOMRONGTHONG, Ph.D.113pp

Background: It is crucial to have knowledge and good protective behavior on influenza pandemic among staff nurses. Effective influenza pandemic management requires understanding of the good knowledge of Pandemic influenza's signs and symptoms, way of transmission and protective measures including proper uses of personal protective equipment. The aim of this study was to compare the knowledge and protective behavior of staff nurses working in health care facilities of Chitwan and Kathmandu district, Nepal.

Methods: A cross-sectional quantitative comparative survey was carried out in health care facilities of Kathmandu and Chitwan District, Nepal from February to mid March 2012. Hospitals based nurses' data was collected using interview method. A total of 424 staff nurses from 5 hospitals of Kathmandu and Chitwan district were involved for this study. By using convenient method 2 districts were selected and hospitals and staff nurses were identified by using simple and systematic random sampling respectively. All data obtained in this study was analyzed by using chi square test for categorical and students T test for continuous data at SPSS 16

Results: 32.10% and 47.20% of staff nurses of Kathmandu and Chitwan exhibited inadequate knowledge while 67.90% and 52.80% of Kathmandu and Chitwan showed adequate level of knowledge about Influenza Pandemic (P = 0.004). It was observed that nurses working area and history of contacting with Influenza pandemic patients were affecting knowledge level scores (p = <0.05). Only 45.99% of respondents were exposed with influenza pandemic patients (73.11% of Kathmandu and 18.86% of Chitwan). Only 16.1% of Kathmandu district and 19.6 % of Chitwan district participants had good protective behavior towards influenza pandemic. The mean knowledge score of the participants of Kathmandu district was 29.22 where as in chitwan it was 27.02. on the other hand the mean protective behavior score of Kathmandu was 20.58 where as in Chitwan it was 21.07. Knowledge and protective behavior were partially positive correlated for Kathmandu district (r=0.106) where as in Chitwan it was partially negative correlated (r= -0.77)

Conclusion: From this study we can conclude participants of Kathmandu district had more knowledge score than Chitwan district where as Chitwan district had good protective behavior score than Kathmandu district. Knowledge only may not work during the pandemic outbreak period, the main import things are availability of protective measures.

Field of Study :	Public Health	Student's Signature	.....
Academic Year :	2011	Advisor's Signature :	.....

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Abbreviation

H1N1	Haemaglotianin and Neuraminidase
ILI	Influenza Like Illness
AICP	Avian Influenza Control Program
UNICEF:	United Nation Children Funds
WHO	World Health Organization
CDC	Central Disease Control and Prevention
EDCD	Epidemiology and Disease Control Division
AHI	Avian and Human Influenza
AI	Avian Influenza
HPAI	Highly Pathogenic Avian Influenza
IP	Influenza Pandemic
HWs	Health Workers
HCPs	Health Care Providers
HCWs	Health Care Workers
PI	Pandemic Influenza
IP	Influenza Pandemic
NRCS	Nepal Red Cross Society
OCHA	Occupation Safety and Health Administration

CHAPTER I:

INTRODUCTION

1. Background and Rationale

A Influenza Pandemic is a global outbreak of influenza virus (WHO, 2009). A influenza pandemic occurs when a new influenza virus emerges for which people have little or no immunity and there is no vaccine. The virus spreads easily from person-to-person, cause's serious illness, and can sweep across the country and around the world in a very short time. (WHO, 2009) Influenza Pandemics may come from a variety of sources historically, Three Influenza Pandemic have occurred in the 20th century. (CDC, 2009) There are three types of influenza viruses, types A, B and C. Only type A influenza viruses cause pandemics. Seasonal influenza outbreaks can be caused by either type A or type B influenza viruses. Influenza type C viruses cause mild illness in humans but do not cause epidemics or pandemics. (WHO, 2009) Pandemics frequently occur in waves of sickness and the virus may increase in potency between outbreaks. Experts estimate that these waves generally last two to three months (CDC, 2009). Currently, scientists estimate the occurrence of pandemics to be about every 19 to 35 years. (Emergency Operations Center, 3 Feburary. 2006).

Today an influenza pandemic is likely to result in 2 to 7.4 million deaths globally. In high income countries alone it accounting for 15% of the world's population and demand for 134–233 million out patients' visits and 1.5–5.2 million hospital admissions. However, the impact of the next pandemic is likely to be the greatest in low income countries because of different population characteristics and the already strained health care resources (WHO, 2008)

In 21st century, the first influenza pandemic was found in April 2009. World Health Organization (WHO) announced a novel strain of influenza A (H1N1) which had spread rapidly throughout the world (WHO Europe, June 2009). This virus was originally referred to as "swine flu" because laboratory testing showed that many of the genes in the virus were very similar to influenza viruses that normally occur in pigs (swine) in North America. But further study showed that the virus is very

different from that which normally circulates in North American pigs. It has two genes from flu viruses that normally circulate in pigs in Europe and Asia and bird's (avian) genes and human genes (quadruple reassortant (Avian influenza Team, 2009). This novel virus seems to be transmitted rapidly through air and contact with contaminated surfaces.

The clinical symptoms of influenza pandemic in most cases are similar to seasonal influenza, such as fever, cough, sore throat, headache, muscle pain, and malaise. Patients may have some or all of these symptoms. The recovery time is about a week, even without medical treatment. However, some patients quickly develop very severe progressive pneumonia. Primary viral pneumonia is the most common finding in severe cases and a frequent cause of death. Secondary bacterial infections have been found in approximately 30% of fatal cases. The most common causes of death in severe cases are respiratory failure and refractory shock. In such cases, patients usually begin to deteriorate around 3 to 5 days after symptom onset. Deterioration is very rapid, as many patients progress to respiratory failure within 24 hours. (WHO, 2009) An influenza pandemic is projected to have a global impact on morbidity and mortality. The 1918 influenza pandemic was responsible for over 500,000 deaths in the United States, while the 1957 and 1968 Influenza Pandemic viruses were responsible for 70,000and 34,000 deaths, respectively. (National strategy for Influenza Pandemic implementation plan, May 2006). In 2005 one modeling study estimated that an influenza pandemic affecting 15 to 35 percent of the United States population could cause 89,000 to 207,000 deaths, 314,000 to 734,000 hospitalizations, 18 to 42 million outpatient visits, and 20 to 47 million additional illnesses. In contrast, from 1990 to 1999, seasonal influenza caused approximately 36,000 deaths per year in the United States. (zinkovich L.D Malvey, 2005)

Hospitals play a critical role within the health system in providing essential medical care to the people, particularly in a crisis, such as an epidemic or a pandemic outbreak. Prolonged and combined outbreaks can lead to the progressive spread of viruses with rapidly increasing service demands that can potentially overwhelm the capacity of hospitals and the health system at large (infection prevention and control in health-care, 2007). To enhance the readiness of the health facilities to cope with the challenges of an influenza pandemic health care personal such as Nurses need to

ensure the well preparedness against priority action (Pandemic flu: management of demand and capacity in health care organisations, 2009)

Infection and contagion are the primary threats in an influenza pandemic. The influenza attack rate among unprotected HCWs might be approximately 60% higher than that of the general population, which would result in substantial absenteeism and morbidity (Wicker et al., 2010; Cooley et al., 2010).Nurses are the first responders who play key players in any response to influenza pandemic, and will be in the front line of exposure to infection. (WHO report, 2009) During an influenza pandemic outbreak, the behaviors and actions of their play a fundamental role in infectivity thus, it is crucial that they have to receive greater education and knowledge regarding preventive measures. Most public health efforts have focused on identifying, treating and isolating people who have the influenza viruses and educating the Health Care personnel about the steps that can take to reduce the risk of transmission. Which include using tissues when sneezing, washing hands regularly with soap and water, and setting up a network of "flu patients". (Blendon et al, 2008). It is also suggested that Nurses should be educated about sign and symptoms, ways of transmission, and preventive measures of influenza pandemic that should take place in hospital. One of the main concerns related to the Influenza pandemic H1N1 is overwhelming burden on medical structures and resources that it poses and the consequent negative impact on mortality and morbidity. That is why it is so important to understand the preventive behavior of Nurses towards influenza pandemic exposure. (NMS, 2009)

Nurses play an essential role in life of the patient as well as they are the most risk of transmission of Influenza Pandemic during the period of care and patient examination. (AICP, 2009) During the period of severe outbreak, there is the high patient flow in the hospital and nurses will be occupied and they might be busy with curing the patient. If at that time they did not use personal protective measure they will be easily attacked by Influenza. Influenza Pandemic has the capacity of swift transmission from the airdrop so they should be protected before diagnosis the Influenza like Illness (ILI) patients.

Nursing concern about attending work during a serious influenza pandemic is not surprising. During the severe acute respiratory syndrome outbreak of 2009, some HCWs reportedly stayed at home for fear of becoming infected and transmitting

infection to family members. A number of surveys have found that 16%–33% of HCWs may not report to work in the event of an influenza pandemic outbreak (prevention, May, 2009). Recent guidance, based on an (unreferenced) survey tool, suggests that up to 50% of the workforce may be absent from work at the peak of the influenza pandemic because of caring responsibilities at home (NHS Employers and Department of Health, 2008). Thus HCWs need to know the transmission risks to make rational decisions about working during an influenza pandemic. Thus in order to mitigate the effects of an influenza pandemic, it is important to identify the knowledge level of Influenza Pandemic and recognize their preventive practices. There are no studies on the knowledge and preventive behavior of HCWs towards the influenza Pandemic in Nepal so there is a need to understand their knowledge and behavior to promote effective management of influenza Pandemic in the health care setting.

1.1 The recent influenza Pandemic: 2009 Influenza Pandemic A "H1N1"

The first case of the influenza Pandemic of 21st Century was occurred in Mexico in 17 April, 2011. Then which spread to the United States and covered the world. In the latter half of April 2009, the World Health Organization's pandemic alert level was sequentially increased from three to five. In June 11, 2009, the pandemic level had been raised to its highest level, level six. Dr Margaret Chan, Director-General of the World Health Organization (WHO), gave a statement on 11 June 2009 confirming that the H1N1 strain was indeed a pandemic. At that time nearly 30,000 confirmed cases was found worldwide. (BBC News, June 11, 2009)

On June 11, 2011 WHO officially declared that the ongoing outbreak of Influenza A H1N1 was a first Influenza Pandemic of the 21st century and decelerated Pandemic, then final name came out which is Influenza Pandemic A H1N1, 2009. Till May 30, 2010 worldwide update by World Health Organization (WHO) more than 214 countries have reported laboratory confirmed cases of Influenza Pandemic A, H1N1 2009, including over 18,114 deaths and 16,32,258 cases. (EDCD, January 18, 2010) After the 2 months of the first case detection in Mexico, Nepal has detected first 3 cases in June 2009. Starting from the June, cases were increasing up to peak of the Influenza Pandemic outbreak in November. Till May 2010, total number of confirmed

positive cases of Influenza Pandemic A H1N1 was 172. Out of them, 36 cases were recorded before declaration of Community transmission (29 Nepalese citizens residing within the country, 2 foreigners and 5 close relatives of confirmed positive cases) and remaining 136 cases were found after community transmission which was declared on October 15 2009. (project A. i., 2010)

On 10 August 2010 – the WHO Director-General Dr Margaret Chan announced that the H1N1 influenza virus has moved into the post-pandemic period. However, localized outbreaks of various magnitudes are likely to continue. (WHO, August, 2010)

1.2 Country Background

Nepal is an agricultural developing country with limited control over the borders has a total population of 28,563,377 (Est.2009). Regionally the country is divided in to 3 parts Terai, Hill and Mountain. Most of the region the country has hills and rugged mountainous with poorly accessible and limited health care facilities. Nepal has a very low health profile with high mortality and morbidity rates, especially among women and children from acute preventable childhood diseases, Respiratory Infections, nutritional disorders and endemic diseases such as malaria, leprosy, and other vector borne diseases. (MOHP, 2009)

The Nepal has faced only one Influenza pandemic outbreak (i.e 2009 H1N1) and one potential pandemic avian influenza/Bird flu (H5N1) outbreak but Many Highly pathogenic Avian influenza (HPAI) cases have been recorded in China and India, which share borders with Nepal to the north and south, respectively. Considering its rugged terrain and security problems, Nepal has porous borders where animal and human population freely flows, increasing the potential for undetected spread of infection to Nepal. It also lies along the migratory pathways of wild birds traveling south westerly from Siberia, and has several geographically distinct wetlands serving as transit points for migratory. (Nepal Red Cross Society, 2009)

In Nepal, Poultry industries, pig husbandry and pork production are widely developed in all developmental regions. In 2010, it was estimated that there were more than 35 million chickens and 600 thousand ducks in the country. (AICP, 2010) Pig farming is

accepted socially and culturally by certain ethnic groups which are associated mainly with very poor, mostly landless, small farmers and low social groups, contributing to the ignorance of these animals in improvement programmes. Farmers are practicing traditional pig farming in a scavenging system, with ignorance in health and hygiene practice which immensely develops the risks of further development of Influenza Pandemic. (AICP report monthly bullitin August, 2010)

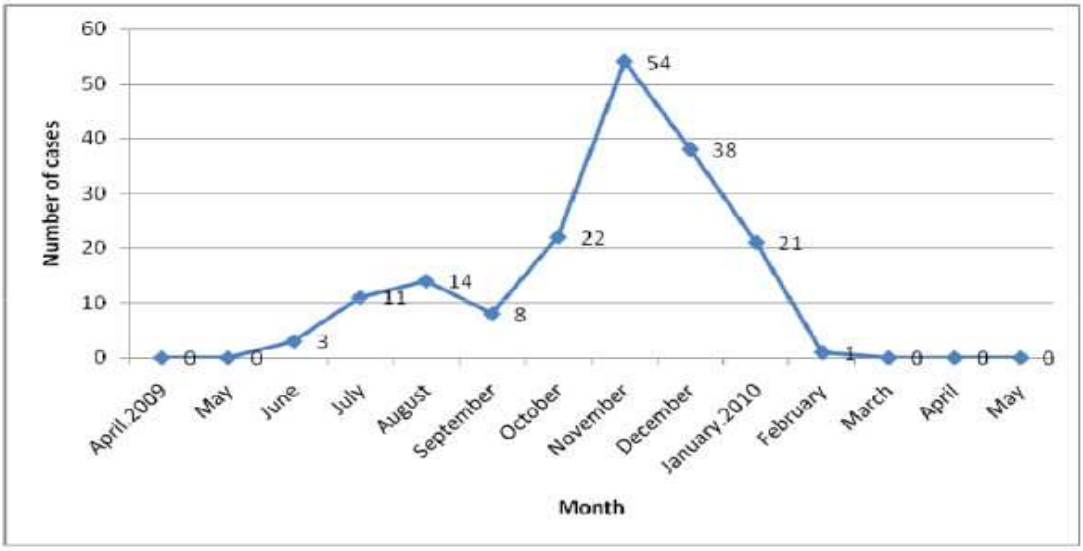
1.3 Situation of Influenza Pandemic in Nepal

Nepal is one of the countries suffering from influenza pandemic with the first case reported on June, 2009 (AICP, 2009). Ministry Of Health and population of Nepal had aggressively taken preventive measures to prevent the spread of Influenza A (H1N1) virus. Health information was given to the public via mass media and also by the health care personnel. Since April 27, 2009 Nepal has started screening febrile travelers with respiratory symptoms from affected countries and the first case was detected on June 21, 2009 and declared on June 29. Community transmission of Influenza Pandemic A/H1N1 2009 was declared on 15 October onwards. (EDCD, 2009) Nepal Ministry of health and population (MOHP) also established at least one isolation wards in every district, regional and private hospitals while as teaching hospital and shukraraj tropical hospital they had established 6 and 4 isolation wards respectively with the necessary equipment and resources.

According to the research conducted by DOHs (Department of health service, Nepal), A total of 609 patients with suspected Influenza Pandemic A H1N1 were tested at National public health laboratory. Out of these samples, 172 (28.3%) were Influenza Pandemic A H1N1 positive and 130 (21.34%) cases were seasonal influenza A as in Table shows below

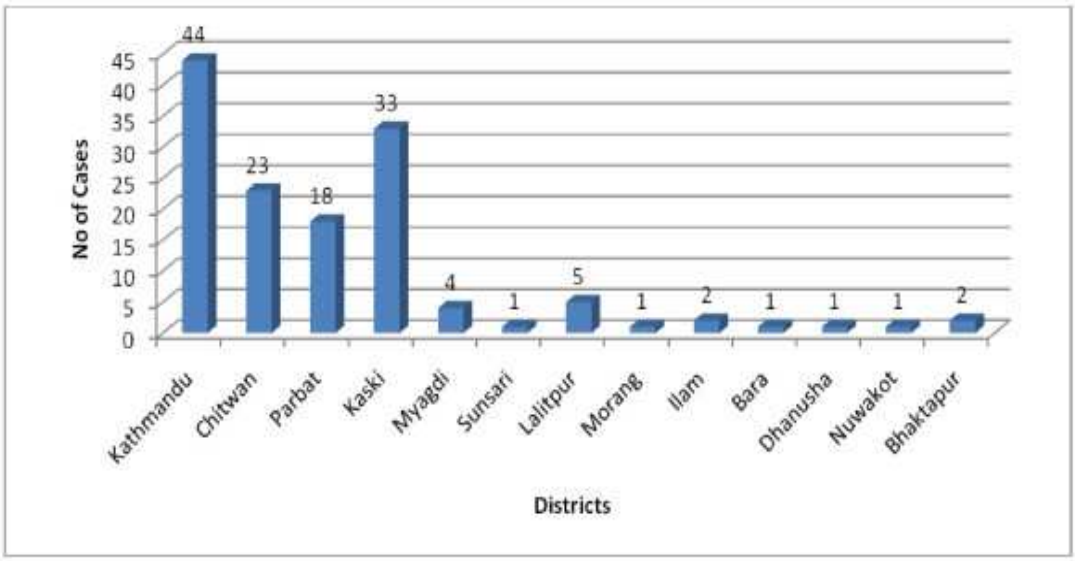
The first case of Influenza Pandemic A/H1N1 was detected in June 2009. Starting from the June, cases were increasing up to peak of the Influenza Pandemic outbreak in November and till the end of May, 2010 the cases were distributed as shows below in figure 1

Figure 1 Epidemic curve of Confirmed cases of Influenza Pandemic A/H1N1 2009 (n= 172



If we see the cases of Influenza Pandemic A H1N1 according to the district wise, we found that after the community outbreak, most of the cases of Influenza Pandemic were from Kathmandu district followed by Kaski and Chitwan.

Figure 2: district wise distribution of total Influenza Pandemic A H1N1 cases after community transmission (n = 136)



Other type of pandemic of Influenza is expected to occur at any time. If the knowledge and practice towards Influenza pandemic among the Nurses are not good, there will be a high number of cases that can lead to higher morbidity and mortality during future outbreak. Knowledge and practice related to Influenza Pandemic are often purported as important measures to prevent its spread. This study will be

conducted with an objective to explore and assess the knowledge and preventive behavior of nursing staffs towards Influenza Pandemic at the health care setting.

2. Research Questions

1. What is the level of knowledge of staff nurses on Influenza Pandemic at some health care facilities of Kathmandu and Chitwan district, Nepal?
2. What are the protective behaviors of staff nurses towards Influenza Pandemic at health care facilities of Kathmandu and Chitwan district, Nepal?
3. What are the factors influencing the level of knowledge of staff nurses towards Influenza Pandemic at health care facilities of Kathmandu and Chitwan district Nepal?

3. Objective

3.1 General Objective

The General objective of this study is to compare the Knowledge and protective behavior of staff nurses towards Influenza Pandemic at some health care settings of Kathmandu and Chitwan district, Nepal

3.2 Specific Objective

1. To compare the responses of staff nurses towards knowledge and protective behavior of Influenza Pandemic based on location by district.
2. To determine the level of knowledge of staff nurses towards of the Influenza Pandemic (Sign and symptoms, mode of transmission and prevention methods) at some health care facilities of Kathmandu and Chitwan district, Nepal
3. To describe the protective measure taken during Influenza Pandemic by staff nurses at some health care settings of Kathmandu and Chitwan district, Nepal
4. To identify the factors influencing protective behavior of staff nurses on Influenza Pandemic at some health care settings of Nepal

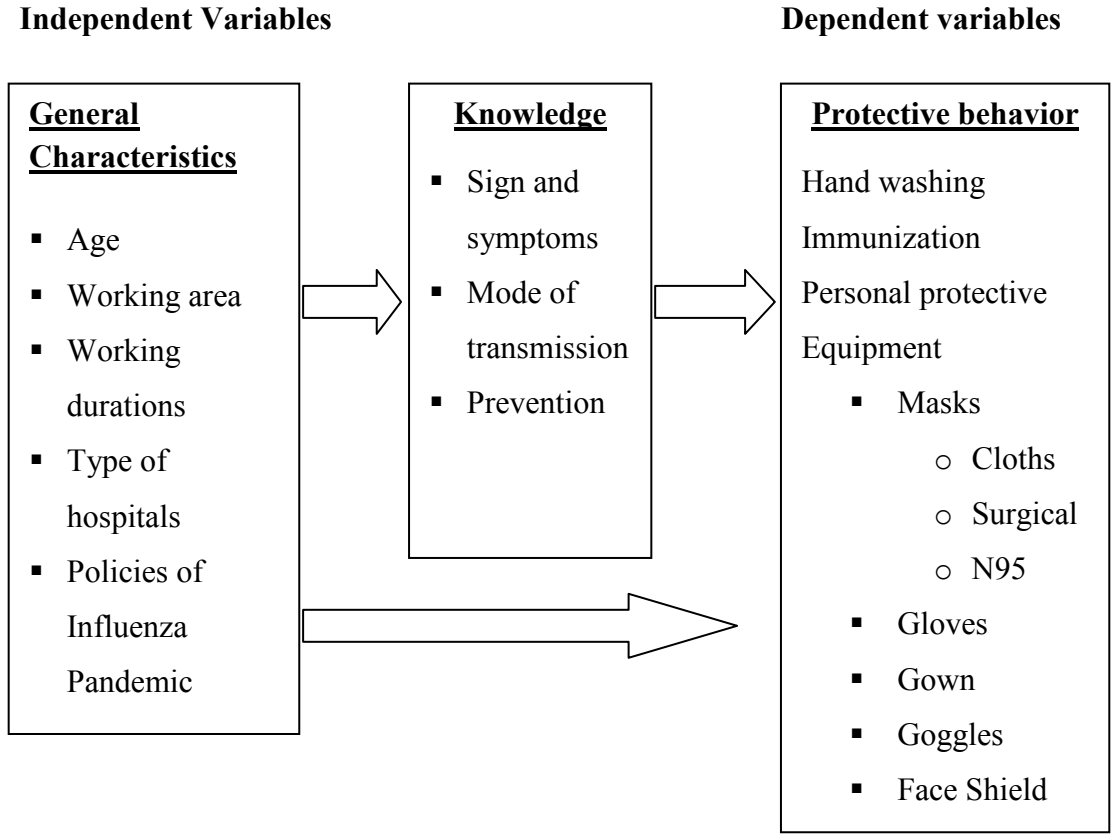
4. Research Hypothesis

1. There is association between the level of knowledge and protective behavior of staff nurses towards influenza Pandemic at health care settings of Nepal

2. There is association between the factors which influence the level of knowledge and staff nurses level of knowledge towards influenza pandemic

4. Conceptual framework

Figure 3: Conceptual framework



5. Operational definition

Staff Nurses: The health care personnel who has completed 3 years diploma courses from college/university and registered in nursing council of Nepal and are authorized to work on diagnose, manage and treat illness, disease, and work in selected hospitals

Health care settings: The health institutions which provides the preventive, promotive and curative services

Dependent variables

Protective behavior: Practical approach adopted by staff nurses to avoid getting influenza pandemic virus which includes washing hands, and regular using personal protective equipment

Personal Protective Equipment (PPE): Cover the body parts by using mask, gloves, Gown, goggles, face shield etc

Surgical Mask: A protective covering over the mouth and nostrils of members of a surgical team, usually held in place by tapes tied over or behind the head, intended to minimize wound contamination.

Gloves: sterile or clean fitted coverings for the hands, usually with a separate sheath for each finger and thumb. Clean gloves are worn to protect health care personnel from urine, stool, blood, saliva, and drainage from wounds and lesions of patients and to protect patients from health care personnel who may have cuts. Sterile gloves are worn when there is contact with sterile instruments or a patient's sterile part.

Gown: The protective garment worn by health care provider designed to prevent the spread of infection between the health care provider and the patient.

Goggles: Type of spectacles, usually large with shields and perhaps padding, used as eye protectors from flying particles, dust, wind, chemical fumes or other external hazards.

Face shield: A type of protective eyewear sometimes used by oral health care workers in place of safety glasses.

Independent variables

Knowledge: Specific information about something. Here for my study knowledge means to understand the signs and symptoms, mode of transmission, high risk groups and control of influenza pandemic

Age: The length of time that one has existed, for my study it will be categorized in to 4 parts which are below 20, 20 to 30, 30 to 40 and above 40 years

Working duration: The time that the staff nurses have been working in the nursing field. In my study the working duration is categorized in four groups that is below 3, 3 to 6, 7 to 10 and above 11 years of experiences

Working area: It refers to the different wards within the hospitals. Here I have categorized it as Anesthesia, emergency, Intensive Care Unit, adult, child and outpatients ward

Types of Hospital: Its refers to the hospital such as community hospital (established with financial support of community peoples), private hospital (established by one or group of people and Government hospital (established and run by government)

CHAPTER II

LITERATURE REVIEW

A new strain of influenza A virus, H1N1 subtype as "Pandemic H1N1 influenza", is a highly infectious virus. (WHO, 2009) The Nepal Ministry of Health and population has recommended preventive behaviors for the Influenza Pandemic such as washing hands, using a tissue when coughing or sneezing, and reducing outings when respiratory symptoms or febrile sensations have developed.(DOHS, 2009) Influenza Pandemic are associated with many more cases of influenza and a higher case fatality rate than that seen in seasonal flu outbreaks. It is common to encounter clinical attack rate ranges for seasonal flu of 5% to 15% in the literature. For influenza pandemic, clinical attack rates are reported in the range of 25% to 50%. (WHO, 2010). Quereshi *et al* found that the most significant barrier to HCWs' willingness to work was fear for their own and their families' health. Based on a survey of mixed clinical and non-clinical workers in the USA Balicer *et al* anticipate up to 50% of HCWs being unwilling to work, with clinical staff more likely to attend than non-clinical ones. (BMC, 2006)

A research entitled "Examining the knowledge of and attitudes to pandemic influenza among general practice staf" conducted in Australia revealed that 71.5% of Nurses felt confident that they have the necessary knowledge to provide patient care during an influenza pandemic occur. More than half the respondents agreed that the risk of contracting pandemic influenza was a part of their job. No one Nurses, indicated that they would go to work during an influenza pandemic if they had symptoms consistent with influenza. The minimum precautions that respondents indicated they would require in order to attend to symptomatic influenza patients are Mask, gloves, gown, pandemic specific vaccine and as well as antiviral. (Holly Seale, 5 April, 2010)

A study conducted by Fatiregun A.A and Olowookere SA regarding the influenza pandemic among senior health workers in southwest Nigeria found that Majority of HCWs have good knowledge about the symptoms of Influenza Pandemic such as fever (73.5%), and runny nose (69.1%). Most (77.9%) identified hand washing with soap and water as a mode of preventing transmission. 83.5% felt an infected person

should be isolated while very few knew oseltamivir (13.2%) and zanamivir (17.6%) are drugs to treat influenza pandemic patients (Fatiregun AA, 2010). Similarly the research entitled "An inquiry of knowledge, attitudes and practices against pandemic H1N1 influenza among Turkish health care workers in Southeast of Turkey by Selda Aslan et al findings revealed that The majority of the health care workers (65.0%) were aware that the virus was transmitted to a person by touching and 57.9% of them felt that droplets after coughing and sneezing was the other way of spread virus, however 7.2% of them stated that PI was not contagious. Although most correctly known signs and symptoms were fever, cough myalgia and fatigue, the least correctly known signs and symptoms were nose bleed, conjunctivitis, convulsion and mental confusion. A large number of participants (74.7%) mistakenly believed that PI was spread by pools and drinking water. The period of communicability was known by 58.6% however the majority of participants were not knowledgeable about infection control period during PI when a person was sick (22.1%). More than one-half of participants thought that the difficulty in breathing and shortness of breath (71.5%), mental confusion (50.8%), and frequent and prolonged vomiting (52.0%) were worthy of an emergency intervention for hospitalization. Regarding the preventive measures the participants reported that frequently hand washing (65.9%), usage of masks (64.9%), no shaking hands (47.3%), and avoiding contaminated touching surfaces (57.3%) were important preventive measures for transmission of PI from human to human. Only 39.3% of the participants knew the correct order of removing contact precaution materials. The majority of participants agreed that patients should be isolated in a single room (70.6%). 42.8% of the participants believed that until seven days a patient was capable of catching PI after travel. 20.8% of respondents were not knowledgeable about hospitalization indication of PI. Of the respondents, 74.6% reported that separation of patient's medical equipment was correct option and 64.9% believed that antiviral therapy should be given by a physician. (Seldan et al, 2010)

A survey on attitudes and behaviors towards preventive measures against pandemic H1N1 influenza 2009 was carried out during the month of October 2009 in Italy among the Italian health care workers through an online questionnaire which reflected that only 67.4% doctors were vaccinated against pandemic H1N1 influenza 2009 followed by 31.2% nurses. In contrast, nurses were more prone (79.5%) than doctors

(64.7%) to wash their hands or use hand sanitizers more frequently in response to reports of Influenza Pandemic outbreak. (Torre, 10 December, 2009)

A research conducted on 42 hospital's HCWs of India about knowledge on swine flu found that Out of all respondents only 25% had heard of swine flu before outbreak and out of which only 65 % Health care knew more than three correct symptoms. 86% respondents who thought that touching the eyes, nose or mouth without washing hands can spread the disease. Altogether 80% respondents thought that the disease was controllable while, nearly 92% of respondents knew about the nearest swine flu control or testing centre. Among all hardly 10% had attended some type of awareness program for swine flu control and 62% were taking precautions against the spread of swine flu. Nearly 70% of respondents thought that masks prevent the disease. For the preventive practices 62% were taking precautions against the spread of swine flu while 14% were taking partial precautions, while 24% were not taking any precautions. However, 46% respondent did not know how to dispose masks. Of the respondents 46% thought that it was not safe to reuse the mask more than once while 40% respondents did not knew the answer and 12% answered that mask can be reused. There were 94% of respondents who thought that if they had developed the symptoms of swine flu then they would have contacted the swine flu centre immediately for diagnosis. Nearly 94% respondents used tissue or handkerchief while sneezing or coughing and when the respondents had to visit some swine flu infected area then 40% wash their hands with soap and water more frequently and thoroughly while 40% respondents avoid contact with the people who appeared sick (Kumar, July 28, 2010)

The limited data on factors influencing HCWs' willingness to work highlight a sense of professional obligation, estimated risk to oneself and families health (Tzeng H-M, 2006). Qureshi and colleagues (Qureshi K, 2005) found the most significant barrier to US HCWs' willingness to work was fear for their own and their family's health. A survey of clinical and non-clinical HCWs in the US estimated that up to 50% would be unwilling to work, with clinical staff more likely to attend than non-clinical. (Balicer RD, 2006) Research from Singapore suggests that the risks posed to self and

to family would be significant concerns for primary care physicians and a similarly Australian study of general practitioners highlights a strong sense of obligation to work coexisting with concerns about being provided with protective equipment and the welfare of dependants. It cannot be taken for granted that these studies can be applied to workers from other health services nor that the results of these studies can be used to inform their attempts to modify attitudes ahead of a pandemic. (Shaw KA, 2006)

1.1 Influenza Pandemic and the Protection of Nurses

Controlling the spread of an influenza pandemic is critical importance to the Nurses in the world and their patients. Given that staff nurse will be on the front lines during influenza pandemic outbreak, protecting them with the best available prevention methods and personal protective equipment (PPE) is imperative to reducing illness and death of a pandemic. While PPE is the focus of this blog, it is only one way to protect workers and control the spread of the influenza virus. (WHO, 2009)

There are many complexities involved in protecting nurses with PPE such as ensuring that workers appreciate the differences between medical masks and respirators. Medical masks are loose-fitting coverings of the nose and mouth designed to protect the patient from the cough or exhaled secretions of the physician, nurse, or other healthcare worker. Medical masks are not designed or certified to protect the wearer from exposure to airborne hazards. They may offer some limited, as yet largely undefined, protection as a barrier to splashes and large droplets. However, because of the loose-fitting design of medical masks and their lack of protective engineering, medical masks are not considered personal protective equipment. (NIOSH science blog, 2009)

Protection of the nurses against infections can also involve gloves, eye protection, face shields, gowns, and other. For the most part, these products are designed to provide a barrier to microbial transfer with particular attention to protecting the wearer's mucous membranes. Yet, they present the nurse with other challenges that include difficulties in verbal communications and interaction with patients and family members, decreased tactile sensitivity through gloves, and physiological burdens such as difficulties in breathing while wearing a respirator. The extent of liquid penetration

is a major issue with gowns and gloves. Comfort and wear ability issues include the breathability of the fabric or material and biocompatibility or sensitivity to avoid contact dermatitis and other skin irritations. (Department of health and human service, centre for disease control and prevention, 2009)

1.2 Role of Nurses during influenza pandemic outbreak

In the event of an influenza pandemic there are effective measures that governments, organizations and individuals can take to help prevent or slow the spread of influenza, minimize its impact and manage recovery. In a severe pandemic the virus may spread rapidly; vaccines, antiviral agents and antibiotics to treat secondary infections may be in short supply, and it may take several months before a vaccine becomes generally available. (Counci, 2008) Nurses will take lead role in the treatment and control of influenza pandemic. It is therefore vital that nurses be aware of their role and professional and ethical issues which may arise for themselves, some of which are outlined below. It is also important that nurses be able to assist in disseminating correct information to the public. (Australia, 2009)

Role of nurses in an influenza pandemic

- Providing the first health care contact for the general public in most cases
- Enacting local pandemic plans
- Assisting with containment measures
- Keeping up to date with information on the global spread of influenza
- Making early identification of people suspected of having influenza and separating these people from others, as required
- Triaging in a range of settings such as general practices, community health care centres and local hospitals
- Dealing with large numbers of people, some of whom may be the ‘worried well’
- Recognizing that there may be increased staff absences for a variety of reasons, including personal illness, fear of contamination, provision of care and support to ill family or household members, isolation or quarantine

requirements, the need to care for children unable to attend schools or child care centres during closures, or revised transport arrangements

- Managing vaccinations
- Accessing personal protection equipment
- Assessing people entering who show signs or symptoms of influenza
- Educating 'non-clinical' staff
- Taking all possible and appropriate precautions to prevent infection of self
- Complying with all infection control and Occupational Health and Safety pre cautions as deemed appropriate in the circumstances

Role of nurses in clinical care areas during a pandemic:

- Providing front line care
- Caring for patients with influenza as well as maintaining other services, such as trauma and emergency services, birthing facilities, palliative care, renal dialysis, and cancer services
- Dealing with large numbers of people in overcrowded facilities
- Strictly adhering to infection control practices, and ensuring that others maintain these practices

Role of nurses in community and primary health care:

- Educating the public about hand hygiene and cough etiquette
- Allaying fears
- Ensuring social isolation of people with evident symptoms
- Being aware that there may be a heightened role for general practice nurses and community nurses, including home visits

Role of nurses in informing the public:

- Peak nursing organizations communicating information to nurses
- Informing the public of correct information to dispel hysteria generated by sensationalist reporting of news by the popular media

Ethical dilemmas faced by nurses:

- Prioritizing care for patients with influenza over those with other conditions
- Balancing family and work responsibilities
- Assessing one's own infectious status for fitness to practice that is, not working if infectious
- Placing oneself at risk of infection to assist others Joint Guideline

Attendance at work during a pandemic:

- Being aware that nurses may be directed to attend work and to stay on the premises throughout the duration of the pandemic, subject to emergency plans (this may not be a legal obligation)
- Knowing that there is a duty of care of the work place to look after staff
- Recognition by health service providers that many nurses have family obligations that may have a high priority in such emergency situations

Vaccination:

Being aware that vaccine may not be available at the onset of pandemic, or for several weeks/months until it is developed; that there will be limited supplies of vaccines; and that governments will priorities distribution and use of such vaccines/treatments

1.3 Clinical Presentations of Influenza Pandemics

The 1918 influenza pandemic, caused by subtype H1N1 viruses, had signs and symptoms of far greater severity than seasonal influenza. It resulted in death for an estimated 500,000 U.S. citizens and as many as 40 million people worldwide. The 1918 pandemic disproportionately affected young, healthy adults, between the ages of 15 and 35. A significant proportion of patients developed fulminant disease, accompanied by a striking perioral cyanosis, leading to death within a few days. Postmortem examinations in these patients frequently revealed denuding tracheobronchitis, pulmonary hemorrhage, or pulmonary edema. Others survived the initial illness, only to die of a secondary bacterial pneumonia. (JCAHO, 2006)

1.4 Cause of Pandemics

Influenza pandemics occur when there is a notable genetic change (termed genetic shift) in the circulating strain of influenza. Because of this genetic shift, a large portion of the human population is entirely vulnerable to infection from the new pandemic strain. Three virus types, influenza A, B and C, can cause respiratory illness and are easily transmitted in crowded and enclosed spaces. Regional and widespread epidemics are most often attributed to influenza A and B viruses, while type C is associated with mild illness, sporadic cases, or minor outbreaks. Influenza A causes the most severe disease in humans, and is the most likely to trigger a pandemic. Influenza A and B possess two surface glycoprotein's: the hemagglutinin (H) and neuraminidase (N). The H subtypes are epidemiologically most important, as they govern the ability of the virus to bind to and enter cells, where multiplication of the virus then occurs. The N subtypes govern the release of newly formed virus from the cells. Influenza A viruses are further subdivided into subtypes dependent on differences in these surface glycoproteins. Although only two influenza A subtypes currently co-circulate globally in humans (H1N1 and H3N2), at least 16 distinct antigenic subtypes of HAs (H1 to H16) and nine NAs (N1 to N9) have been identified in wild aquatic birds. (Europe, 2009)

A minor change in these antigens (antigenic drift) may result in epidemics, since incomplete protection remains from past exposure to similar viruses. A major change (antigenic shift) may result in a worldwide pandemic if the virus, for which humans have no protection, is efficiently transmitted from human to human. Antigenic shift occurs only with influenza A viruses. Influenza A viruses were the cause of the three Pandemics in the 20th Century. (WHO, Organization, 2009)

Difficulty in controlling illness from one flu season to the next is due to changes in virus types A and B. Both undergo constant, but relatively subtle mutations (antigenic drift), accounting for the different influenza epidemiology, strains, and vaccines seen from year to year. As they lack a proof-reading mechanism, the small errors that occur when the virus copies itself are left undetected and uncorrected. As a result, influenza A viruses undergo constant stepwise changes in their genetic make-up. This strategy, known as antigenic drift, works well as a short-term survival tactic for the virus: the

speed with which slight variations develop keeps populations susceptible to infection. Pandemics occur when an entirely new subtype of influenza A virus emerges (antigenic shift) through recombination of human and animal antigens (swine or avian). Not all antigenic shifts cause a pandemic, but if a novel subtype is virulent and easily transmitted, a pandemic is probable. Apart from being highly unstable and prone to small mutational errors, influenza viruses have a segmented genome, consisting of eight genes, that allows easy swapping of genetic material - like the shuffling of cards - confecting a host with two different viruses. If this new "hybrid" virus contains the right mix of genes, causing severe disease and allowing easy and sustainable human-to-human transmission, it will ignite a pandemic. This works well as a long-term survival tactic: immunologically, a new virus subtype starts from scratch and is guaranteed a very large population of susceptible hosts. (Department of Health and Human Services)

1.5 Common Sign and Symptoms

Symptoms caused by infection with Novel H1N1 Flu appear to be similar to those of seasonal Flu. It usually starts suddenly. Common symptoms include:

- Fever
- Runny nose
- Cough
- Sore throat
- Diarrhea
- Headache
- Muscle pain
- Sore throat
- Runny nose
- Myalgia
- Myalgia
- Fatigue
- Rhinitis
- Conjunctivitis
- Nausea

- Convulsion
- Arthralgia

Sometimes older man (over 65) and children under five do not get a fever with the flu. Sometimes children have nausea, vomiting, or diarrhea when sick with the flu. (WHO, 2009)

1.6 Influenza Modes of Transmission

The main way that influenza viruses are spread is from person to person in respiratory droplets of coughs and sneezes. (This is called "droplet spread.") This can happen when droplets from a cough or sneeze of an infected person are propelled (generally up to 3 feet) through the air and deposited on the mouth or nose of people nearby. Though much less frequent, the viruses also can be spread when a person touches respiratory droplets on another person or an object and then touches their own mouth or nose (or someone else's mouth or nose) before washing their hands. A person can spread the flu starting one day before he or she feels sick. Adults can continue to pass the flu virus to others for another three to seven days after symptoms start. Children can pass the virus for longer than seven days. Symptoms start one to four days after the virus enters the body. Some persons can be infected with the flu virus but have no symptoms. During this time, those persons can still spread the virus to others. (Brid/Avian Flu Mode of Transmission)

Incubation Period:

The incubation period for Seasonal and Novel H1N1Influenza infection is from 1-5 days from the time of contact to onset of symptoms. (WHO, Influenza Pandemic)

High Risk Groups

Personnel at higher risk for complications from influenza infection include pregnant women, persons 65 years old and older, and persons with chronic diseases such as asthma, heart disease, diabetes, diseases that suppress the immune system, and certain other chronic medical conditions. (CDC, 2010)

Preventive Measures

Preventing transmission of influenza virus and other infectious agents within healthcare settings requires a multi-faceted approach. Spread of influenza virus can occur among patients, HCWs and visitors. Vaccination and early treatment with antiviral medications are very important for healthcare personnel at higher risk for influenza complications because they can prevent hospitalizations and deaths. Healthcare personnel at higher risk for complications should check with their healthcare provider if they become ill so that they can receive early treatment. (CDC bullitin, 2009)

Key Prevention Measures for Individuals and Communities

Social distancing (keeping at least an arm's length distance from others, minimizing gatherings), respiratory etiquette (covering coughs and sneezes), hand hygiene, and household ventilation, are likely to be the most effective public health measures and are highly recommended.

Once cases of Influenza Pandemic in a community are widespread, evidence and experience suggest that interventions to isolate patients and quarantine contacts would probably be ineffective, not a good use of limited health resources, and socially disruptive.

Ill people should as far as possible be cared for at home by a designated caregiver (with appropriate home-care instructions communicated in advance) and advised not to attend health-care facilities unless they deteriorate or develop danger signs so as not to overwhelm health facilities. Supportive care entails bed rest, fluids, medication for fever, antibiotics if prescribed, and good nutrition. WHO recommends that mask use should be based on risk, including frequency of exposure and closeness of contact with potentially infectious people. (WHO, Influenza, 2010)

1.7 Personal Protective Equipment

Gloves

HHS recommends the use of gloves made of latex, vinyl, nitrile, or other synthetic materials as appropriate, when there is contact with blood and other bodily fluids, including respiratory secretions.

- There is no need to double-glove.
- Gloves should be removed and discarded after patient care.

- Gloves should not be washed or reused.
- Hand hygiene should be done after glove removal. Because glove supplies may be limited in the event of Influenza Pandemic, other barriers such as disposable paper towels should be used when there is limited contact with respiratory secretions, such as handling used facial tissues. Hand hygiene should be practiced consistently in this situation. (HHS. 2005)

Gowns

Healthcare workers should wear an isolation gown when it is anticipated that soiling of clothes or uniform with blood or other bodily fluids, including respiratory secretions, may occur. HHS states that most routine Influenza Pandemic patient encounters do not necessitate the use of gowns. Examples of when a gown may be needed include procedures such as intubation or when closely holding a pediatric patient.

- Isolation gowns can be disposable and made of synthetic material or reusable and made of washable cloth.
- Gowns should be the appropriate size to fully cover the areas requiring protection.
- After patient care is performed, the gown should be removed and placed in a laundry receptacle or waste container, as appropriate. Hand hygiene should follow. (OSHA, January, 2005)

Goggles/Face Shields

The department of Health and Human Service Influenza Pandemic Plan does not recommend the use of goggles or face shields for routine contact with patients with Influenza Pandemic; however, if sprays or splatters of infectious material are likely, it states that goggles or a face shield should be worn as recommended for standard precautions. If a Influenza Pandemic patient is coughing, any healthcare worker who needs to be within 3 feet of the infected patient is likely to encounter sprays of infectious material. Eye and face protection should be used in this situation, as well as during the performance of aerosol-generating procedures (CDC,2008)

Surgical Masks and Respirators

Respirators are designed to reduce an individual's exposure to airborne contaminants, such as particles, gases, or vapors. An air-purifying respirator accomplishes this by filtering the contaminant out of the air before it can be inhaled by the person wearing the respirator.

A type of respirator commonly found in healthcare workplaces is the filtering face piece particulate respirator (often referred to as an "N95"). It is designed to protect against particulate hazards. Since airborne biological agents such as bacteria or viruses are particles, they can be filtered by particulate respirators. To assure a consistent level of performance, the respirator's filtering efficiency is tested and certified by NIOSH.(NIOSH, 2009)

Hand Hygiene

To reduce the risk of becoming infected with influenza, healthcare workers working with influenza patients should follow rigorous hand hygiene measures. Healthcare facilities should ensure that sinks with warm and cold running water, plain or antimicrobial soap, disposable paper towels, and alcohol-based hand disinfectants are readily accessible in areas where patient care is provided. (US department of Health service, 2005)

Self-monitoring

Health staff should monitor their temperatures twice daily. Fevers should be reported and the staff member should confine themselves at home. If a staff member becomes unwell, treatment with antivirals as well as supportive care as for other patients should be provided at home by a caregiver. (2005, November to Devember, 2008)

Other Hygienic Measures

Healthcare workers working with Influenza Pandemic patients should also take care to:

- Avoid touching their eyes, nose, or mouth with contaminated hands (gloved or ungloved) to avoid self-inoculation with the Influenza Pandemic virus.

- Avoid contaminating environmental surfaces that are not directly related to patient care such as light switches and doorknobs.

CHAPTER III

RESEARCH METHODOLOGY

1.1 Research Design

A Quantitative cross-sectional comparative study design was used for the study. The main focus of this research was to compare the collected information on knowledge and protective behaviour among staff nurses by two districts (Kathmandu and Chitwan).

1.1 Study Population

The targeted populations for this study were staff nurses who were working in health care facilities of Kathmandu and Chitwan Districts, Nepal

1.3 Study Area

This study was conducted in the some hospitals of Kathmandu and Chitwan districts, Nepal, which are listed below

Table 1: Number of Nurses in different hospitals of Kathmandu and Chitwan

Kathmandu	S. Nurse	Chitwan	S. Nurse	Grand Total
1. Sukraraj Tropical infectious disease control Hospital	52	1. Bharatpur Hospital	106	
		2. Chitwan Medical College	106	
2. Om Hospital	54			
3. Teaching Hospital	106			
Total	**212**		**212**	**424**

Kathmandu is the capital of the nation where we can find modern technical equipment and competent physician in the hospitals. Most of the patients from all districts use to visit Kathmandu for the treatment. Due to these reasons the patient flow in the hospitals of Kathmandu is very high and almost all beds are always occupied by patients. Also, the National public health laboratory is also located in Kathmandu, where people can diagnosis Influenza pandemic A H1N1 cases; if they have positive cases they immediately referred to the hospitals of Kathmandu. During the 2009

Influenza Pandemic outbreak, Kathmandu had 4.4 per 100,000 cases of influenza pandemic patients.

Chitwan is known as the medical city. There are 2 medical colleges, 1 district level government hospital and many community and private hospitals. The first cases of Influenza Pandemic were identified in Chitwan on November, 2009. At that time there were more than 2500 peoples infected with influenza-like illness and they were admitted in different hospitals of Chitwan district. (Laboratory, 2009) Chitwan district had 4.6 per 100,000 cases.

1.4 Inclusion Criteria

The researcher had asked questions only to those staff nurses who had been working at least since 2010 and before and the hospitals which had isolation bed during the period of influenza outbreak in Nepal.

1.5 Exclusion Criteria

The researcher did not ask the questions again to those nurses who were working in more than one hospital.

1.6 Sampling Techniques

The researcher used a convenience sampling for selection of districts, simple random sampling technique for hospitals and systematic random sampling for respondents.

Out of the 75 districts, research had selected two districts Chitwan and Kathmandu conveniently according to the past patient burden/cases of Influenza Pandemic A H1N1 in 2009 and 2010. By using the simple random sampling researcher had chose 2 hospitals from Kathmandu and 2 hospitals from Chitwan district respectively. Researcher had gone through all the selected hospitals but in case of Kathmandu district due to the deficient number of respondent in Shukraraj tropical infectious hospital researcher again did a simple random sampling and collected a data from another hospital i.e Om Hospital. To select the respondents' researcher had listed the entire staff nurses name that fell under inclusion criteria from the hospital's ward register and by using a sample random sampling he chose one name and calculated a sampling interval. After that by using this sampling interval all the desired sample was fulfilled from the respective hospitals.

1.7 Sample Size

The required sample size was calculated by using the Cochran formula.

The sample size was 423. Here researcher used the prevalence of level of knowledge of respondents (P) as the 50% because no research has been done on the same topics before

$$n = \frac{(Z_{\alpha/2})^2 P (1 - P)}{(d)^2}$$

$$n = \frac{(1.96)^2 0.05 (1 - 0.5)}{(0.05)^2} = 384$$

Where,

n = sample size.

p = estimated proportion of the population that is likely to have knowledge about PI is 50%

d = desired level of precision.

z= value from normal distribution associated with 95% confidence interval of 1.96.

Taking 10% as the withdraw cases into account, the total sample size were 384+38.4(10%) = 423

1.8 Study Period

The study was conducted within a period of 10 months starting from the August, 2011 to May, 2012. The data collection was carried out on February and March of 2012

1.9 Development of Measurement Tools

A structured questionnaire was developed to compare the knowledge and protective behavior of Influenza Pandemic among staff nurses. The comparison was assessed by using a questionnaire containing the following information:

1. General characteristics:

   The first part of the questionnaire was general characteristics of Nurses, which includes the age, types of hospital, working area , duration of her working as the staff nurse, Hospitals/Pandemic Influenza guidance, formal infection training and ever contact with Pandemic influenza patients or not. There were altogether 7 questions under this heading.

2. General knowledge of Influenza Pandemic

   The second part of the questionnaire comprised knowledge towards Influenza Pandemic consisting sign and symptoms, mode of transmission, High Risk Group, Vaccine, Personal protective equipment and prevention methods. All together 46 questions were included to measure the general knowledge of the participants.

3. Protective Behavior of Nurses

   The third part of the questions includes staff nurse's preventive behavior to protect from Influenza Pandemic exposure. This part was related about personal protective equipment and immunization. Most questions were closed-ended and participants were allowed to choose correct answers (Yes/No/Not sure). There were 44 questions under this heading.

1.10 Data Collection Process

A total of 4 data collectors were hired to collect the data and before the collection of data they were well oriented by researcher. At the time of orientation researcher gave a brief introduction about Influenza Pandemic and methodology including objectives and research questions. To make data collectors more familiarize with questionnaires the researcher had explained questionnaire to them and role play was carried out. A

researcher was presented in each hospital to supervise the data collection. To ensure data quality,the questionnaire was re-checked by the researcher at the end of the day. This study was the comparative study between the two districts so researcher had taken equal number of respondents from each hospital. Hence for this study researcher had selected 106 respondents from each hospital and 212 from each district.

1.11 Scoring procedure

To assess the knowledge and protective behavior level of respondents, the responses were scored to 0 for an undesired response and 1 for a desired response. By using the Bloom's cut off point. Knowledge score was categorized as

0 – 60% desired answers – Inadequate Knowledge
60% – 80% desired answers – Moderately adequate Knowledge
81% – 100% desired answer – Adequate Knowledge

By using the references from Salden et al research, Protective behavior score was categorized as

0 – 50% Desired answers – Bad protective behavior
51% - 100% Desired answers – Good protective behavior

1.12 Data Analysis

After the collection of the data, the collected data was edited and coded carefully. Coded data was manually tabulated as well as categorized and entered into database. These tabulated data were analyzed scientifically and interpreted descriptively.
For the purpose of analysis, the individual scores were summed up to yield a total score. The data were analyzed using the statistical package for social sciences (SPSS) version 16.0. Student's t-test was used to find the significant difference in the means of knowledge and protective behavior at p value ≤ 0.05. One-way ANOVA was used

to find the association of knowledge and protective behavior in relation to different age groups, type of hospitals, working area and hospitals guidance. Spearman's correlation test was used to find the correlation between knowledge and protective behavior. Chi square test was used to calculate the association between dependent variables (protective behavior) and independent variables (general characteristics and level of knowledge). The interpretations of the results were presented using tables, pie charts, bar diagrams and histodiagram.

1.13 Validity and Reliability

The validity of the questionnaire was carried out and verified by three highly qualifies expertise of Public health colleges of Nepal. The prescribed guidelines from the research committee of Nepal Health and Research Council (NHRC) were followed accordingly.

The reliability was maintained by pre-test among 30 respondents at Bir Hospital. The methodology was used based on the sound epidemiological principles and worldwide popular theory of statistics. Data editing of the information was carried out at the same day of data collection. Operational definitions were strictly implemented. The, Cronbach's alpha coefficient was used for testing reliability of the measurement tools for knowledge, which gave the result of 0.781.

1.14 Ethical Consideration

The study was reviewed and approved by the Nepal Health Research Council(NHRC), Ministry of Health and Population(MOHP).

The questionnaire did not elicit any sensitive information. Research assistants informed all study participants of their rights of participating in the study. The written and verbal consent were taken from the related hospitals. The objective and the purpose of the study were explained among the respondent before giving the questionnaire. No one was forced to participate in this study it was voluntary participation. Researcher did not ask the reason when some respondents refused to participate. The signed informed consent sheets were detached from the questionnaire

and kept in a separate location so that they could not be linked. No names were recorded on the data collection forms.

Throughout this study, privacy and confidentiality were emphasized. All data were collected in a private setting. The data was used only for the purpose of research work and for the partial fulfillment of MPH degree.

1.15 Limitation of the Study

This study covered only five hospitals of Kathmandu and Chitwan District, so outcome of the study cannot be generalized as the level of knowledge of whole nation's staff Nurses. The researcher asked the protective practices of influenza pandemic outbreak situation which was happened in 2009 so there might be some chances of recall bias. Researcher had also the resource and time constrains so could not able to cover all the hospitals of the respective districts. The accuracy of the information depends upon the willingness of the respondents. The researcher took the data only a single time so level of knowledge might be changed after some times. Moreover, after the influenza pandemic outbreak nurses had done lots of work on Influenza Pandemic so there knowledge level might have been changed as comparative to pre influenza period hence the answer given my nurses regarding the preventive behaviors may have been contaminated with recent advancement of their knowledge towards Influenza Pandemic

1.16 Expected Benefit and Outcome

Respondents will probably not be directly benefited from this research, but the information came from this research may help hospital/Gov to make health care setting safer to work Nurses in future outbreak of Influenza Pandemic. The findings of this research may help national government to give emphasis at Nurses protective behavior while updating the national Influenza pandemic contingency plan and Hospitals guidelines. At last but not least the study showed the Knowledge and protective behaviors of nurses towards Influenza Pandemic so government can decide whether they need further information or not regarding Influenza Pandemic

CHAPTER IV

RESULTS

This chapter presents the results of the study which were comprised in to the follows sections

Descriptive study (By using frequency and percentages)

1.1 General characteristics
1.2 Knowledge towards Influenza pandemic A H1N1
1.3 Protective behavior applied by respondents

Analytical study (By using chi square test)

1.1 Association between the general characteristics and knowledge
1.2 Association between characteristics and protective behaviors
1.3 Association between Knowledge and protective behaviors

Analytical study (by using student T test**)**

1.3 Associations between the general characteristics and knowledge
1.4 Association between characteristics and protective behaviors
1.5 Association between Knowledge and protective behaviors

4.1 General characteristics

Participants involved in this study

There were a total of 424 staff nurses who participated voluntarily in this study. The study was carried out in the 5 hospitals of Nepal comprising 3 hospitals from Kathmandu (TU Teaching Hospital, Shukhraraj Tropical Infectious Disease Control Hospital and Om Hospital) and 2 from Chitwan (Chitwan Medical College and Bharatpur Government District Hospital). Table 2 shows the number of respondents from different hospitals of Kathmandu and Chitwan district.

Table 2: Participants involved in the study

	Kathmandu		Chitwan		Total
Hospitals	N	%	N	%	N
1. TU Teaching Hospital	106	25.00	-	-	106
2.Om Hospital	52	12.26	-	-	52
3.Shurakraraj Tropical Infectious Disease Control Hospital	54	12.74	-	-	54
4.Bharatpur Hospital	-	-	106	25.00	106
5.Chitwan Medical College	-	-	106	25.00	106
Total	**212**	**50.00**	**212**	**50.00**	**424**

4.3 Average year of working of participants

The bar graph below represents the average year that the respondents has been working in this job. The average respondent's age of participants from Kathmandu district was 8.44 years of working where as 4.71 years of working of Chitwan district. The overall average working year of entire respondents was 6.575 years.

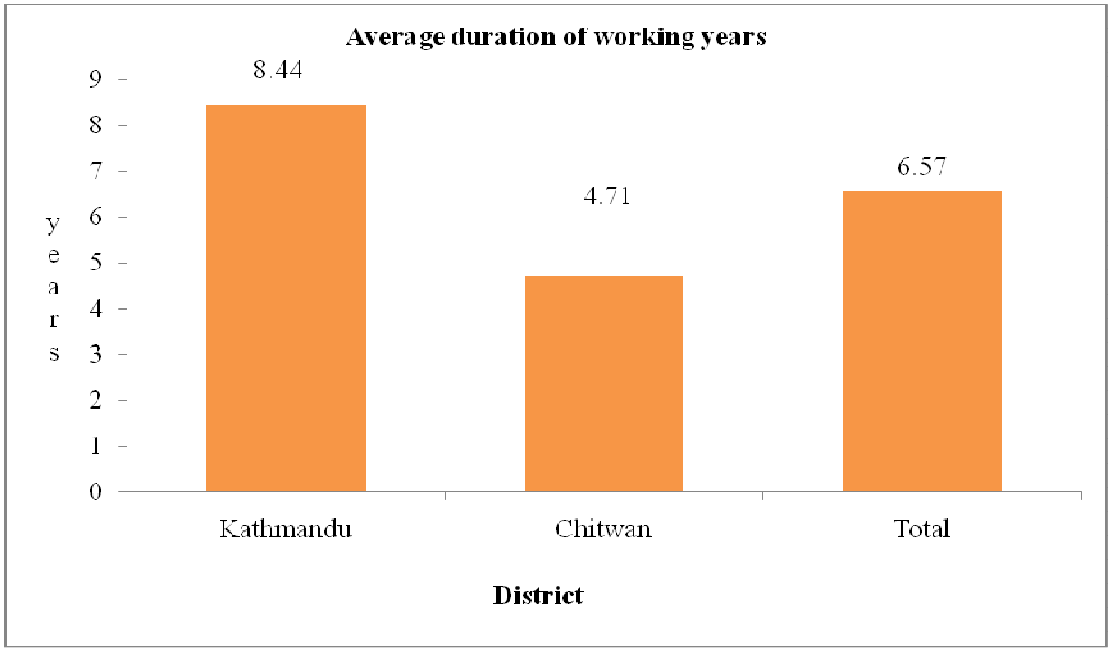


Figure 4: Average duration of working of participants

4.1 General characteristics

Table 3 illustrates that more than 71% of the respondents ranged from the age of 21 to 30 years old followed by 31 to 40 years with 16.27%. Very few respondents 3.54% were below 20 years of old. The highest percentages of the respondents participated in this study from Kathmandu and Chitwan district was 21 to 30 years with 55.19% and 87.74% respectively. Majority of the respondents from Kathmandu district belongs to adult ward (45.75%) followed by surgical ward with 26.88%. The least respondents were from Anesthesia, OPT (Out patient treatment), Emergency, OT (Operation Theater) and Maternity. In Chitwan district most of the respondents were from adult ward as same as Kathmandu district with 27.37% followed by 24.50% from Emergency ward. The least percentages of respondent belongs to surgical, OPT and OT wards respectively. In an overall most of the respondents were from Adult ward with 155 (36.56%) and child ward with 69 (16.04%) respectively. Majority of the respondents from both Kathmandu and Chitwan district respond that they did not receive any formal infection control training within last three years. If we compare the findings among the district wise we can see that more respondents of Chitwan district

received infection control training rather than Kathmandu district with 36.79% and 26.88% respectively. Nearly two third of the respondents from both district did not receive the training. Most of the respondents from Kathmandu and Chitwan district with 73% and 80.18% told that their hospitals do not have any influenza pandemic policies or guidance. If we talk about the influenza pandemic preparedness policies and guidance with in district level we can see that only 22.40% of the respondents of all hospitals said that they have influenza pandemic preparedness policies or Guidance. Most of the respondents' i.e 73.11% from Kathmandu district had ever came in contact with influenza pandemic patients where as only 18.87% of respondents from Chitwan district had came in contacted with influenza pandemic patients. If we see the overall contact percentages we can find that below 50% of the respondents have ever came in contact with the H1N1 patients.

Table 3 General Characteristics

	Kathmandu		Chitwan		Total	
	(N =212)	%	(N = 212)	%	(N = 212)	%
Age of the respondents						
≤ 20 years	8	3.77	7	3.30	15	3.54
21 to 30 years	117	55.19	186	87.74	303	71.46
31 to 40 years	53	25.00	16	7.55	69	16.27
Above 40 years	34	16.04	3	1.42	37	8.73
Area of working						
Anesthesia	3	1.41	8	3.77	11	2.59
Surgical	57	26.88	4	1.89	61	14.39
ICU	15	7.07	39	18.39	54	12.74
Adult	97	45.75	58	27.37	155	36.56
Child	35	16.50	34	16.04	69	16.27
Outpatient clinic	3	1.41	2	0.94	5	1.18
Emergency	1	0.47	52	24.53	53	12.50
OT	1	0.47	0	0.00	1	0.24
Maternity hospital	0	0.00	15	7.07	15	3.54
Have you received any formal infection training?						

Yes	56	26.42	78	36.79	134	31.60
No	156	73.58	134	63.21	290	68.40
Do you have influenza pandemic preparedness policies or guidance						
Yes	53	25.00	42	19.81	95	22.40
No	155	73.11	170	80.18	325	76.65
Not sure	4	1.89	0	0.00	4	0.94
Have you ever contact with influenza pandemic patients						
Yes	155	73.11	39	18.87	195	45.99
No	57	26.89	173	81.13	229	54.01

4.2 Knowledge about pandemic influenza

Table 4 demonstrates that almost 63% of the respondents gave the correct answer towards the date of first cases of influenza pandemic found in Nepal. While comparison the knowledge of respondents according to district wise we can clearly say that respondents from Chitwan district gave more right answer than respondents from Kathmandu district with 66.5% and 58.96% respectively. Most of the respondents i.e 86% had clear knowledge that pandemic is known as the worldwide influenza outbreak. If we compare the findings according to the district wise we can find that respondents of Kathmandu district had slightly higher knowledge than respondents of Chitwan district with 88.22 % and 83.98% respectively. Only few number of respondents i.e 37.26% knew the correct answer regarding the time that world has faced influenza pandemic outbreak in 20th century. 31.60 % of respondents from Kathmandu and 42.94% of the respondents from Chitwan district replied the correct answer that the world has faced 3 pandemic influenza in 20th century.

Table 4: Knowledge about pandemic influenza

Respondent's respond on correct answer	**Kathmandu** (N = 212)%	**Chitwan** (N = 212)%	**Total** (N =424)%
In Nepal PI was Outbreak in 2009	125 (58.96)	141(66.50)	266(62.73)
PI is known as Worldwide	187(88.22)	178(83.98)	365(86.08)

In 20th century world has faced Three outbreak	67 (31.60)	91(42.94)	158 (37.26)

4. Knowledge towards Signs and Symptoms of Pandemic influenza

Table 5 shows that almost all of the respondents knew that fever, runny nose, sore throat, headache were the major sign and symptoms of influenza pandemic where as the least correctly known signs and symptoms were nose bleed, diarrhea among children, conjunctivitis, Anthralgia convulsion and mental confusion. According to World health organization, 2009 The major sign and symptoms of influenza pandemic A H1H1 are Fever, Runny noses, and sore throat and these kind of symptoms were known by more than 80% of the respondents.

Table 5: Signs and Symptoms of Influenza pandemic

		Kathmandu		Chitwan		Total	
		N	%	N	%	N	%
Fever	Yes	211	99.52	207	97.64	418	98.58
	No	1	0.47	3	1.41	4	0.94
	Not sure	0	0.00	2	0.94	2	0.47
Runny nose	Yes	202	95.28	168	79.24	370	87.26
	No	4	1.88	33	15.56	37	8.73
	Not sure	6	2.83	11	5.18	17	4.01
Nose bleed	Yes	62	29.24	44	20.75	106	25
	No	108	50.94	122	57.54	230	54.25
	Not sure	42	19.81	46	21.69	88	20.75
Sore throat	Yes	186	87.73	175	82.54	361	85.14
	No	2	0.94	8	3.77	10	2.36
	Not sure	24	11.32	29	13.67	53	12.50
Loss of appetite	Yes	189	89.15	143	67.45	332	78.3
	No	5	2.35	25	11.79	30	7.08
	Not sure	18	8.49	44	20.74	62	14.62
Headache	Yes	181	85.37	164	77.35	345	81.37
	No	11	5.18	14	6.62	25	5.90

	Not sure	20	9.43	34	16.03	54	12.73
Diarrhea	Yes	45	21.22	74	34.91	119	28.07
	No	76	35.84	77	36.32	153	36.08
	Not sure	91	42.92	61	28.77	152	35.85
Back pain	Yes	78	36.79	118	55.66	196	46.23
	No	65	30.66	54	25.47	119	28.07
	Not sure	69	32.54	40	18.86	109	25.71
Cough	Yes	175	82.54	152	71.69	327	77.12
	No	16	7.54	31	14.62	47	11.08
	Not sure	21	9.92	29	13.67	50	11.79
Myalgia	Yes	164	77.35	144	67.92	308	72.64
	No	11	5.18	28	13.2	39	9.20
	Not sure	37	17.45	40	18.86	77	18.16
Fatigue	Yes	208	98.11	176	83.01	384	90.57
	No	0	0.00	14	6.62	14	3.30
	Not sure	4	1.88	22	10.37	26	6.13
Rhinitis	Yes	167	78.77	146	69.52	313	73.82
	No	13	6.13	30	14.28	43	10.14
	Not sure	32	15.09	34	16.19	66	15.57
Conjunctivitis	Yes	93	43.86	58	27.61	151	35.61
	No	51	24.05	103	49.04	154	36.32
	Not sure	68	32.07	49	23.33	117	27.59
Nausea	Yes	145	68.39	95	45.23	240	56.80
	No	31	14.62	73	34.76	104	24.73
	Not sure	36	16.98	42	20.01	78	18.57
Convulsion	Yes	52	24.52	66	31.42	118	27.83
	No	70	33.01	89	42.38	159	37.57
	Not sure	90	42.45	55	26.19	145	34.20
Anthralgia	Yes	64	30.18	72	34.28	136	32.08
	No	63	29.71	62	29.52	125	29.48

	Not sure	85	40.09	76	36.19	161	37.97
Mental confusion	Yes	29	13.67	59	28.09	88	20.75
	No	69	32.54	90	42.85	159	37.5
	Not sure	114	53.77	61	29.04	175	41.27

Knowledge towards Mode of transmission of influenza pandemic

The majority of the participants of both districts were aware that the disease was transmitted to a person by droplet sneezing (95.25%) and face to face talking with infected patients (65.57%). 0nly 40.09% of the respondents and 27.92% of the respondents knew that contaminated surface touching and hand shaking with infected person were the other way of transmission of influenza virus. If we compare this knowledge on district wise we can find that surface touching was the way of transmission which was more known by respondents of Kathmandu than Chitwan district with 47.16 and 33.33% respectively. Mistakenly some of the respondents i.e 15.57%, 26.42% and 29.01% believe that influenza virus was transmitted via food, mosquito bite and drinking water respectively

Table 6: Mode of transmission of influenza pandemic

		Kathmandu		Chitwan		Total	
		N (212)	%	N(212)	%	N(424)	%
Surface touching	Yes	100	47.16	70	33.33	170	40.09
	No	90	42.45	105	50	195	45.99
	Not sure	22	10.37	37	17.45	59	13.92
Droplet sneezing	Yes	204	96.22	200	94.28	404	95.28
	No	3	1.41	9	4.28	12	2.83
	Not sure	5	2.35	3	1.42	8	1.89
Face to face talk	Yes	148	69.81	130	61.32	278	65.57
	No	48	22.64	60	28.84	108	25.47
	Not sure	16	7.54	22	10.57	38	8.96
Hand shaking	Yes	65	30.66	61	28.77	126	29.72
	No	131	61.79	125	58.96	256	60.38
	Not sure	16	7.54	26	12.26	42	9.91

Mosquito bite	Yes	27	12.73	39	18.75	66	15.57
	No	165	77.83	128	59.61	293	69.1
	Not sure	20	9.43	45	21.63	65	15.33
Food	Yes	51	24.05	61	29.32	112	26.42
	No	121	57.07	103	47.59	224	52.83
	Not sure	40	18.86	48	23.07	88	20.75
Drin inking water	Yes	50	23.6	73	35.1	123	29.01
	No	120	56.6	105	49.52	225	53.07
	Not sure	42	19.8	34	16.03	76	17.92

Knowledge towards Preventive measures of PI

The participants reported that regular hand washing (87.50%), cover nose and mouth during sneezing (98.35%), Keep distance from infected person (89.86%), avoiding crowd (83.02%) and vaccination against pandemic influenza (79.95%) were important preventive measures to prevent from influenza pandemic transmission from human to human. If we see the district wise knowledge we can find that slightly equal number of respondents from both of districts knew the correct answer.

Table 7: preventive measures

		Kathmandu		Chitwan		Total	
		N (212)	%	N(212)	%	N(424)	%
Regular Hand washing	Yes	177	83.49	194	91.51	371	87.70
	No	19	8.97	6	2.83	25	5.90
	Not sure	16	7.54	12	5.66	28	6.40
Cover nose/mouth	Yes	208	98.11	209	98.58	417	98.35
	No	4	1.88	2	0.94	6	1.42
	Not sure	0	0.00	1	0.47	1	0.23
keep distance form	Yes	187	88.2	194	91.5	381	89.86
	No	10	4.71	15	7.07	25	5.90
	Not sure	15	7.07	3	1.41	18	4.25

infected

Avoid crowd	Yes	193	91.03	159	75	352	83.02
	No	7	3.3	41	19.33	48	11.32
	Not sure	12	5.66	12	5.66	24	5.66
Vaccination	Yes	158	75.42	181	85.37	339	79.95
	No	30	14.15	18	8.49	48	11.32
	Not sure	24	11.32	13	6.13	37	8.73
Drinking boiled water	Yes	90	42.45	116	54.71	206	48.58
	No	76	35.48	56	26.41	132	31.13
	Not sure	46	21.69	40	18.86	86	20.28

Knowledge towards High Risk Group from H1N1

The table 8 illustrates that out of 424 participants most of them were familiar that child below 5 years (83.73%), elderly people (75.94%), pregnant women (63%), and chronic patients (84%) were the groups who fall under high risk group of Influenza pandemic A H1N1 2009.

82.08% of the respondents of Chitwan district had idea that under 5 children were the high risk group from the influenza pandemic. According to the definition of the WHO, 2009 high risk group means those groups of people which have low immunity power to fight against the infection or diseases and once they caught from the infection it takes longer time to recover. Here the respondents of Chitwan also knew that elderly people (69.65%), pregnant women (60.38%), chronic patients (88.68%) were falls under the high risk groups.

According to WHO 2009, adult group was falls under the risk group but not in high risk group so mistakenly 37.03 % of respondents thought that adult group was also high risk group from influenza pandemic. If we compare the knowledge of the respondents according to district wise we can say that respondents of Kathmandu district had high knowledge than Chitwan district towards the high risk group.

Table 8: High risk group

		Kathmandu		Chitwan		Total	
		N (212)	%	N(212)	%	N(424)	%
Child below five years	Yes	181	85.37	174	82.08	355	83.73
	No	18	8.49	18	8.49	36	8.49
	Not sure	13	6.14	20	9.43	33	7.78
Elderly people	Yes	171	80.66	151	69.65	322	75.94
	No	19	8.97	19	9.46	38	8.96
	Not sure	22	10.37	42	20.89	64	15.09
Pregnant women	Yes	143	67.45	128	60.38	271	63.91
	No	30	14.15	26	12.26	56	13.2
	Not sure	39	18.4	58	27.36	97	22.87
Chronic patient	Yes	170	80.19	188	88.68	358	84.43
	No	6	2.83	4	1.89	10	2.36
	Not sure	36	16.98	20	9.43	56	13.21
Adult	Yes	103	48.58	54	25.47	157	37.03
	No	53	25.00	83	39.15	136	32.07
	Not sure	56	26.42	75	35.38	131	30.90

Knowledge towards influenza pandemic vaccine and others

Table 9 illustrates that out of 212 respondents of Kathmandu district, 62.26% of respondents replied that influenza pandemic vaccine was effective measure against influenza pandemic where as nearly equal percentage (66.50%) of the respondents of Chitwan district replied the same. Out of 424 respondents only 37.97 % of the respondents had thought that all pandemic influenza patients must not have been hospitalized. Among them 40.10% of the respondents were from Kathmandu and 35.80% of the respondents were from Chitwan district. Only 22.16% knew that pandemic influenza was not a fatal contagious disease. According to WHO pandemic influenza was not a fatal diseases because it has only 25% of morbidity rate and 1 to

3% of mortality rate among these morbidity rate. The respondents of Chitwan district had high knowledge regarding to this matter in comparison to Kathmandu district with 25.00 % and 19.30 % correct answer respectively. 48.34% of the respondents from both of district knew that pandemic influenza become infectious one day before start of symptoms to seven days after start of symptoms. 42.50% of the participants from Kathmandu district and 28.30% from Chitwan district knew the correct answer that influenza control measure continues for seven days. Most of the respondents 75.50% from Kathmandu and 73.11 % from Chitwan district knew that during Influenza Pandemic outbreak situation only one influenza pandemic patient has to keep in one room. More than 86% of the respondents were well known that difficult breathing and shortage of the breath were the situation that needs urgent intervention.

Table 9: Respondents answer towards knowledge related questions about PI

Respondents responds on correct answers		Kathmandu (N= 212) %	Chitwan (N= 212) %	Total (N= 212) %
influenza pandemic vaccine is effective measure against influenza pandemic	Yes	132 62.30	141 66.50	273 64.38
All patients with pandemic influenza must have been hospitalized	No	85 40.10	76 35.80	161 37.97
Influenza pandemic is a fatal contagious disease	No	41 19.30	53 25.00	94 22.16
When do pandemic influenza become infectious - One day before start of symptoms to seven days after start of symptoms		103 (48.60)	102 42.00	205 (48.34)
How long should infection control measure be continued	Seven days	90 (42.50)	60 (28.30)	150 (35.37)

During Influenza Pandemic outbreak situation, if possible how many people must have been hospitalized in one room	One	160 (75.50)	155 (73.11)	315 (74.29)
What is situation that required urgent intervention _ Difficult breathing and Shortness of breath		181 (85.40)	185 (87.26)	366 (86.32)

Knowledge towards order of removing contact precaution materials

Out of 424 only 37.73% of the respondents knew the correct order of removing of contact precaution materials. If we see the result we can find that respondent of Kathmandu district had high knowledge than Chitwan district with 43.90% and 31.60% respectively. Here 1,2,3,4 5 means

1 = Gloves removed firstly, later lab coat is removed

2= Hands are washed or rubbed with hand disinfectant

3= Glasses are removed

4 = Mask is removed

5= Hands are washed once again or rubbed with hand disinfectant

Table 10: Order of removing contact precaution materials

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
5,4,3,1,2	29	13.70	41	19.30	70	16.50
2,1,3,4,5	83	39.20	49	23.10	132	31.13
1,2,3,4,5	93	43.90	67	31.60	160	37.73
3,4,1,2,5	7	3.30	41	19.30	48	11.32
Missing	-	-	14	6.60	14	3.30
Total	212	100.0	212	100.00	424	100.00

4.3 Protective behavior

Have you used following Personal protective equipment during Influenza pandemic outbreak time to protect from transmission of Influenza Pandemic, if yes tick the frequency. The frequency were divided in to 3 categorize sometime, Often and Every time which means;

Sometime: It refers that nurse used personal protective equipment while physical examination and contact with influenza patient but not every day every time

Often: It refers that s/he used personal protective equipment usually but because of some causes very rarely s/he had not use it

Every time: It refers that nurse used the personal protective equipment while contacting and examining every pandemic influenza patients from the beginning to the end

Uses of masks

Table 11 reflects that during the influenza pandemic outbreak time 33.55% respondents of Kathmandu district and 12.50% of Chitwan district had used the masks sometime only where as majority of the respondents from Kathmandu and Chitwan district used the mask every time with 38.6 and 67.50% respectively.

Uses of gloves

During the influenza pandemic period most of the respondents used gloves every time. If we see the percentage according to district we can observe that in Kathmandu equal percentage of respondents i.e 36.13% used gloves often and every time but in case of Chitwan district most of the respondent used gloves every time with 66.67% and the remaining larger percentage of participants i.e 37.50 % used glove sometime only.

Washing hands with chemical and soap

During the pandemic influenza outbreak time at the hospitals majority of the respondents (63.5%) every time washed their hands with chemical or soaps followed by sometime washed their hand (21.4%). 61.29% of the respondents of Kathmandu and 72.50% of respondents from Chitwan district washed their hands every time

Wearing gown

Out of the 195 respondents 43.59% replied that they were wearing gown sometime only followed by every time with 23.08%. Most of the participants of Kathmandu and Chitwan district had used the gown for sometime only rather than every time with 41.94% and 50.00% respectively.

Wearing goggle

Out of the 195 respondents majority of the respondents (46.15%) respond that they never used the goggle during the influenza pandemic outbreak time (Kathmandu 40% and Chitwan 47.74%).

Table 11: uses of PPE by nurses

	Kathmandu		Chitwan		Total	
	N = 155	%	N = 39	%	N	%
Uses of Masks						
Some time	52	33.55	5	12.50	57	29.23
Often	44	28.39	8	20.00	52	26.67
Every time	59	38.06	26	67.50	86	44.10
Never	0	0.00	0	0.00	0	0.00
Uses of gloves						
Some time	43	27.74	15	38.46	58	29.89
Often	56	36.13	3	7.69	59	29.89
Every time	56	36.13	21	53.85	77	39.69
Never	0	0.00	0	0.00	0	0.00

Washing hands with chemical and soap						
Some time	35	22.58	7	17.50	42	21.54
Often	22	14.19	4	10.00	26	13.33
Every time	95	61.29	29	72.50	124	63.59
Never	3	1.94	0	0.00	3	1.54
Wearing gown						
Some time	65	41.94	19	48.71	84	43.29
Often	32	20.65	8	20.51	40	20.61
Every time	37	23.87	8	20.51	45	23.19
Never	21	13.55	4	10.27	25	12.88
Wearing goggle						
Some time	47	30.32	13	33.33	60	30.92
Often	12	7.74	8	20.51	20	10.30
Every time	22	14.19	3	7.69	25	12.88
Never	74	47.74	15	38.46	89	46.87

Personal protective equipment

Using PPE during physical examination of the patients

Table 12 shows that in the period of Influenza pandemic outbreak the highly applied personal protective equipments by respondents of Kathmandu district during the period of physical examination of patients were gown and gloves with 93.55 and 99.35% respectively. Where as in Chitwan gown and gloves were fully used i.e 100 %. The least applied personal protective equipment during physical examination of patients were cloths masks, face shield and goggles

Using PPE during sit behind the patient and taking history

The respondents who have contacted with influenza pandemic patients at hospital during the outbreak time respond that gown and gloves were highly used during the period of taking history. More than 85% of the respondents of Chitwan district used gown and gloves as the precaution where as majority of the respondents did not use cloths masks, N95, face shield and goggles.

Majority of the respondents from Kathmandu district replied that gown, gloves and surgical masks were the major precaution that they used while sit behind the patients and taking the history with 83.9%, 81.94% and 69.03% respectively. Same as like Chitwan majority of the respondents (more than 80%) did not use goggle, faceshied, N95 masks and cloths masks for the precaution.

Using PPE during Nasopharyngel swab

During the Nasopharyngeal swab, most of the respondents of Kathmandu district used gown (90.07%), gloves (65.15%) and surgical masks (85.16%) where as the least used precautions were cloths masks (33.55%), N95 Mask (18.06) and goggle (5.80%)

Where as in Chitwan district, the most used precaution materials were gown (100.0%), gloves (76.92%) and surgical masks (84.61%). The least used precaution materials were cloth masks (15.38%) and goggles (10.25%)

Using PPE during Oro pharyngeal swab

During the Oro pharyngeal swab the frequently used precaution materials at Kathmandu district were gown (98.06%), gloves (62.58%) and surgical masks (85.16%) where as in Chitwan district gown (100%). Gloves (71.79%), surgical masks (92.30%) were used. The least used precautions from both of districts were cloth masks, face shield and N95 mask.

Using PPE during Nebulization

The majority of the participants of both district were used gown, gloves and masks during the nebulization period, where as goggles, faceshield and N-95 masks were used by very few participants.

Table 12 : uses of personal protective equipments in different procedures

	Kathmandu (N=155)		Chitwan (N=39)	
	Yes	No	Yes	No
During physical examination of patient				

using gown	145(93.55)	10(6.45)	39(100.0)	0(0.00)
using gloves	154(99.35)	1(0.65)	39(100.0)	0(0.00)
using surgical mask	101(65.16)	54(34.84)	31(79.48)	8(20.51)
using cloths mask	40(25.81)	115(74.19)	7(17.94)	32()82.05
using N95	6(3.87)	149(96.12)	3(7.69)	36(92.30)
using faceshield	8(5.16)	147(94.84)	0(0.00)	39(100.0)
using goggles	6(3.87)	149(96.12)	0(0.00)	39(100.0)
During sit behind the patient and taking history				
using gown	130(83.9)	(25)16.12	33(84.61)	6(15.38)
using gloves	127(81.94)	28(18.06)	34(87.17)	5(12.82)
using surgical mask	107(69.03)	48(30.96)	27(69.23)	12(30.76)
using cloths mask	31(20.00)	124(80.00)	9(23.07)	30(76.92)
using N95	33(21.29)	122(78.71)	8(20.51)	31(79.48)
using faceshield	4(2.58)	151(97.41)	2(5.12)	36(92.30)
using goggles	1 (0.64)	154(99.35)	0(0.00)	39(100.0)
During Naso pharngeal swab				
using gown	141(90.07)	14(9.03)	39(100.0)	0(0.00)
using gloves	101(65.16)	54(34.84)	30(76.92)	9(23.07)
using surgical mask	132(85.16)	23(14.83)	33(84.61)	6(15.38)
using cloths mask	52(33.55)	103(66.45)	6(15.38)	33(84.61)
using N95	28 (18.06)	127(81.94)	9(23.07)	30(76.92)
using faceshield	65(41.94)	90(58.06)	9(23.07)	30(76.92)
using goggles	9(5.80)	146(94.19)	4(10.25)	35(89.74)
During Oro pharngeal swab				
using gown	152(98.06)	3(1.90)	39(100.00)	0(0.00)
using gloves	97(62.58)	58(37.41)	28(71.79)	11(28.20)
using surgical mask	132(85.16)	23(14.83)	36(92.30)	3(7.69)
using cloths mask	45(29.03)	110(70.96)	12(30.76)	27(69.23)
using N95	42(27.09)	113(72.90)	8(20.51)	31(79.48)
using faceshield	57(36.77)	98(63.22)	13(33.33)	26(66.67)
using goggles	15(9.67)	140(90.32)	3(7.69)	36(92.30)

During Nebulization				
using gown	140(90.32)	(15)9.68	39(100)	0(0.00)
using gloves	147(94.84)	8(5.16)	39(100)	0(0.00)
using surgical mask	109(70.72)	46(29.68)	25(64.10)	14(35.89)
using cloths mask	36(23.23)	119(76.77)	13(33.33)	26(66.66)
using N95	28(18.06)	127(81.94)	9(23.07)	30(76.92)
using faceshield	20(12.9)	135(87.1)	5(12.8)	34(87.17)
using goggles	47(30.32)	108(69.68)	4(10.25)	35(89.74)

Preventive measure you have applied first

Table 13 reveals that during the pandemic influenza outbreak in 2009 most of the respondents' i.e 62.37% used masks when they saw the influenza pandemic patients coming near to them. In that case 22.68% of the respondents did not shake their hands with the influenza patients. The least applied methods was did not touch surface that were contaminated with 1.03%

Most of the respondents 58.70% of the Kathmandu district and 76.92% of the respondents of Chitwan district had used masks first when they saw that pandemic influenza patients are coming near to them where as the second applied precaution was not shaking hands with 22.58% and 23.07% of Kathmandu and Chitwan district respectively. Only 46.15% of the respondents who had contacted with influenza pandemic patients during 2009 felt protected from the patients. 45.16% of respondents of Kathmandu and 50% of respondents from Chitwan felt protected from the patients at hospital where as 38.70% from Kathmandu and 37.5% from Chitwan did not feel protect from the patients. 54.72% of the respondents said that during 2009 pandemic influenza outbreak situation at their hospital the patient's medical equipments were separated from other patients medical equipments where as 27.12% of the respondents were not sure whether it were separated or not. If we compare the findings with district wise we can find that hospitals of Kathmandu used to separate the things rather than Chitwan district with 66.50% and 42.92% respectively.

Only 11.5% of the total respondents were vaccinated from seasonal vaccine and majority of the respondents (79.48%) were not vaccinated. Only 7.5% of respondents of Kathmandu district and 15.6% of respondents from Chitwan district were vaccinated from seasonal influenza vaccine respectively where as majority of the respondents (92.45%) were not vaccinated and only7.55% were vaccinated from the H1N1 vaccine. The respondents 12.7% who had been working in hospitals of Kathmandu district were vaccinated but very few respondents of Chitwan i.e 7.5% were vaccinated from the H1N1 vaccine. Most of the respondents who were vaccinated received this vaccine from the H1N1 vaccine campaigns 2010 organized by Department of Health services Nepal.

Most of the respondents' i.e more than 65% thought that nurses were not protected from the transmission of influenza pandemic during outbreak situation. Only 16 respondents (7.55%) of Kathmandu district thought that nurses were protected where as nearly 1/4th of the respondents of Chitwan thought the same way. the information regarding whether the respondents of both districts want to work or not during future pandemic influenza outbreak. The data below reflects that 51% of the respondents showed their willingness to work at the hospitals during the influenza pandemic outbreak whereas 26.89% of the respondents' said that they don't want to work during that situation. The remaining 21.7% of the respondents are not sure whether they will work or not. More percentage of the respondents of Chitwan district responds that they want to work during the influenza pandemic period with 55.19% followed by Kathmandu with 47.64%.

Table 13: protective behavior related questionnaires

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Preventive measure that nurses applied first						
Frequent washing hand	27	17.41	0	0.00	27	13.91
Usage of masks	91	58.70	30	76.92	121	62.37
Not shaking hands	35	22.58	9	23.07	44	22.68

Do not touch surface that are contaminated	2	1.21	0	0.00	2	1.03
Total	**155**	**100.00**	**39**	**100.00**	**194**	**100.00**
Did u feel yourself protect during caring/examining PI patients						
Yes	70	45.16	20	50.00	90	46.15
No	60	38.72	15	37.50	75	38.46
Not sure	25	16.12	5	12.50	30	15.38
Total	**155**	**100.00**	**40**	**100.00**	**195**	**100.00**
Medical equipment separated from other patients' medical equipment						
Yes	141	66.51	91	42.92	232	54.72
No	25	11.79	52	24.53	77	18.16
Not sure	46	21.70	69	32.55	115	27.12
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100.00**
Have you taken seasonal vaccine						
Yes	16	7.50	33	15.60	49	11.52
No	178	84.00	159	75.00	377	79.48
Not sure	18	8.50	20	9.40	38	8.90
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100.00**
Have you taken H1N1 vaccine						
Yes	27	12.70	5	2.40	32	7.55
No	185	87.30	207	97.60	392	92.45
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100**
Do you think nurses are protected from H1N1						
Yes	16	7.55	54	25.47	70	16.51
No	150	70.75	129	60.85	279	65.80
Not sure	46	21.70	29	13.68	75	17.69
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100.00**
Do you want to work in the future as the Nurses during PI outbreak time						
Yes	101	47.64	117	55.19	218	51.42

No	51	24.06	63	29.72	114	26.89
Not sure	60	28.30	32	15.09	92	21.70
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100.00**

Analytical studies

Knowledge level score

Participants answered a total of 46 questions regarding the knowledge of influenza pandemic. Each correct answer was given one point which made the total score of 46 for knowledge assessment. The knowledge score was ranged from 1 to 39. There were three negative questions which were mixed randomly with the positive ones. The mean score of the knowledge was 28.13 with standard error of 0.23. The cut off point for the classification was based on Benjamin bloom cut off scale. Respondents who got above 80% of total score were classified as having adequate knowledge, while those who got 60% to 80% of total score were categorized as moderate adequate knowledge and those who got lower than 60% of total score were classified as having inadequate level of knowledge.

Relation between districts and Level of Knowledge

On assessing the knowledge level, it was found that majority of the respondents (66.51%) of Kathmandu district had moderately adequate level of knowledge where as in Chitwan district it was 51.89%. Very few percentages of the respondents' i.e 1.42% and 0.94% had only adequate level of knowledge in Kathmandu and Chitwan district respectively which was statistically significant at 0.004.

Table 14: Relation between working districts and Level of Knowledge

	Inadequate		Moderately adequate		Adequate			
District	N	%	N	%	N	%	$\chi 2$	P Value
Kathmandu	68	32.08	141	66.51	3	1.42	10.18	**0.004**

Chitwan	100	47.17	110	51.89	2	0.94
Total	168	39.62	251	59.19	5	1.17

Here the participants who scored for adequate level of knowledge were found very low so the participants who had adequate and moderately adequate level of knowledge were merged into one group (adequate group). Hence the analyses were done among the two level of knowledge (inadequate and adequate level of knowledge).

	Inadequate		adequate			
District	N	%	N	%	$\chi 2$	P Value
Kathmandu	68	32.08	144	67.90		
Chitwan	100	47.17	112	52.10	10.18	**0.004**
Total	168	39.62	256	60.38		

Relationship between age and of level of knowledge

The table below reveals the level of understanding of knowledge according to age group. In Kathmandu district we can see Majority o the respondents were belongs to age group 21 to 30 years of old. Among this age group 64.10% of the participants had adequate level of knowledge followed by 35.90% with inadequate level of knowledge. 53 participants were aged from 31 to 40 years and out of them only 60.40 % had the adequate level of knowledge. Here the significant value was 0.012 which is statistically significant.

Regarding the respondents' age and their level of knowledge of Chitwan district, more respondents were fall in between the age of 21 to 30 years too. Out of them 52.20% had adequate level of knowledge 47.80% had inadequate level of knowledge. Here the significant value was 0.301 which one is not statistically significant to the Chitwan district.

สมการ 1 Table no.15: Relation between age and Level of Knowledge

	≤ 20 years	21- 30 years	31-40 years	>41 years	Total	$\chi 2$	P Value

Kathmandu	Inadequate	2(25.00)	42(35.90)	21(39.60)	3(8.80)	68(32.10)	10.79	**0.012**
	Adequate	6(75.00)	75(64.10)	32(60.40)	31(91.20)	144(67.90)		
	Total	8(100.0)	117(100.0)	53(100.0)	34(100.0)	212(100.0)		
Chitwan	Inadequate	2(28.60)	89(47.80)	9(56.20)	0(0.00)	100(47.2)		
	Adequate	5(71.4)	97(52.20)	7(43.8)	3(100.0)	112(52.8)	3.76	0.301
	Total	7(100.0)	186(100.0)	16(100.0)	3(100.0)	212(100.0)		

Relation between kind of hospitals and knowledge

The table 16 reflects the association between the kind of hospitals and level of knowledge. The participants of Kathmandu district who has been working in public hospitals have moderately adequate knowledge (69.7%) followed by inadequate knowledge (30.3%). The P value for this association was 0.165 which was statistically not significant.

Most of the respondents of Chitwan district who has been working in private hospitals had adequate knowledge (63.8%) followed by participants of district hospital (42.7%). here the p value was 0.002 which means that there is association between the kind of hospitals and level of knowledge

Table 16: Relation between kind of hospitals and Level of Knowledge

		District	Public	Private	Total	$\chi 2$	P Value
Kathmandu	Inadequate knowledge	0 (0.0)	56 (30.30)	12 (46.20)	68 (32.10)	3.08	0.165
	adequate knowledge	1 (100.00)	129 (69.70)	14 (53.80)	144 (67.90)		
Chitwan	Inadequate knowledge	59 (57.30)	3 (75.00)	38 (36.20)	100 (47.20)	10.47	**0.002**
	Adequate knowledge	44 (42.70)	1 (25.00)	67 (63.80)	112 (52.80)		

Relation between duration of works and level of knowledge

The table 17 reflects the association between duration of works with level of knowledge. those people who had worked less than 8 years of old have high percentages of adequate knowledge (68%) followed by 67.7 with the working

experiences between 17 to 24 years. Here the P value for duration of works and level of knowledge was 0.625 which is statistically not significant. For the Chitwan district like those people who had worked 8 to 16 years have high percentage of adequate and inadequate level of knowledge with 58.3% and 41.7% respectively, which one is also not statistically significant.

From the above description we can say that long years of working experiences does not matter for the level of knowledge regarding influenza pandemic.

Table 17: Relation between duration of works and Level of Knowledge

		0 - 8	9-16	17 - 24	25- 32	Total		
		N %	N%	N%	N%	N%	$\chi 2$	PValue
Kathm	Inadequate	49 (32.00)	9(37.50)	10(32.30)	0(0.00)	68(32.10)	1.82	0.625
andu	Adequate	104(68.00)	15(62.50)	21(67.70)	4(100.)	144(67.90)		
	Total	153 (100)	24(100)	31(100)	4(100)	212(100)		
Chitwa	Inadequate	93(47.40)	5 (41.70)	1(50.00)	1(50.00)	100(47.20)	0.674	0.943
n	Adequate	103(52.60)	7(58.30)	1(50.00)	1(50.00)	112(52.80)		
	Total	196(100)	12(100)	2(100)	2(100)	212(100)		

Relation between working area and level of knowledge

The table 18 shows the relation between working area and level of knowledge. in the Kathmandu district the participants who were from surgical ward had 26.3% inadequate and 73.7% adequate level of knowledge. Likewise 35.1% of participants from adult ward had inadequate and 64.9% of participants had adequate level of knowledge. Here the other area includes the anesthesia, emergency and outpatient wards. The relation between area of working and level of knowledge was not significant for Kathmandu district.

In case of Chitwan district most of the respondents were from Adult ward with 41.4% of inadequate level of knowledge and 58.6% of adequate level of knowledge. All the area of participants had high adequate level of knowledge but respondents from the ICU ward had high inadequate level of knowledge rather than adequate level of knowledge with 69.2% and 30.8% respectively. For the Chitwan district the

association between area of working and level of knowledge was significant with P value 0.009

Table 18: Relation between working area and Level of Knowledge

		Surgical N	ICU N	Adult N	Child N	Other N	Total N	χ2	P Value
Kathmandu	Inadequate	15 (26.30)	6 (40.00)	34 (35.10)	10 (28.60)	3 (37.50)	68 (32.10)	6.97*	0.392
	Adequate	42 (73.70)	9 (60.00)	63 (64.90)	25 (71.40)	5 (62.50)	144 (67.90)		
	Total	57 (100)	15 (100)	97 (100)	35 (100)	8 (100)	212 (100)		
		Emergency	ICU	Adult	Child	Maternity	Total		
Chitwan+	Inadequate	25 (48.10)	27 (69.20)	24 (41.40)	17 (50.00)	2 (13.30)	100 (47.16)		
	Adequate	27 (51.90)	12 (30.80)	34 (58.60)	17 (500)	13 (86.70)	112 (52.83)		
	Total	52 (100)	39 (100)	58 (100)	34 (100)	15 (100.0)	212 (100)	17.51*	**0.009**

+ 3(25%) from other area had inadequate and 9(75%) had adequate knowledge
*fisher exact test

Relationship between people who received training and Level of Knowledge

The table 19 shows the association between the level of knowledge and the people who received the training. Most of the respondents of Kathmandu district who received the training had high adequate knowledge (71.4%) where as people who did not receive the training had high inadequate level of knowedgle (33.3%). From the table we can see the significant value of 0.616 which one is not statistically significant

so we can conclude by saying that received the training and not received the training does not matter on level of knowledge of the respondents

In case of Chitwan district those people who did not receive the training had high inadequate level of knowledge (50.0%) but those people who had received the training had high adequate level of knowledge (57.7). here the significant value was 0.319 which one is not statistically significant.

Table 19: Relation between people who received training and Level of Knowledge

		Yes	No	Total	χ^2	P Value
Kathmandu	Inadequate knowledge	16 (28.60)	52(33.30)	68(32.10)	0.429	0.616
	adequate knowledge	40 (71.40)	104(66.70)	144(67.90)		
	Total	56(100.0)	156(100.0)	212(100.0)		
Chitwan	Inadequate knowledge	33 (42.30)	67(50.00)	100(47.20)	1.71	0.319
	Adequate knowledge	45(57.70)	67(50.00)	112 (52.40)		
	Total	78(100.0)	134(100.0)	212(100.0)		

Relation between hospitals guidance and level of knowledge

The table 20 reveals the relationship between the hospital/influenza pandemic guidance and the level of knowledge of the participants. In case of Kathmandu district participants of those hospitals who did not have PI guidance had high inadequate level knowledge (38.1%) followed by those hospitals who have PI guidance I.e 15.1%. here the P value shows the significant association between hospitals/PI guidance and level of knowledge at 0.004.

In case of Chitwan district the respondents of those hospitals who have PI/Hospitals guidance had adequate level of knowledge (54.8%) followed by those who do not have hospitals/pandemic influenza guidances (52.4%) The P value here is not significant at 0.05.

Table 20: Relation between hospital guidance and Level of Knowledge

		Yes	No	Not sure	Total	χ2	P Value
Kathmandu	Inadequate	8 (15.10)	59 (38.10)	1 (25.00)	68 (32.10)	10.19*	**0.004**
	Adequate	45 (84.90)	96 (61.90)	3 (75.00)	144 (67.90)		
	Total	53 (100.0)	155 (100.0)	212 (100.0)			
Chitwan	Inadequate	19 (45.20)	81 (47.60)	-	100 (47.20)	0.078	0.863
	Adequate	23 (54.80)	89 (52.40)	-	112 (52.80)		
	Total	42 (100.0)	170 (100.0)	-	212 (100.0)		

Relationship between the people who ever contact with influenza pandemic patients and Level of knowledge

The table 21 illustrates the level of knowledge with the people who ever contact with influenza pandemic patients. Most of the participants from Kathmandu who ever contact with influenza pandemic patients had adequate knowledge (72.9%) followed by inadequate knowledge (27.1%). Those people who do not receive the training have more inadequate knowledge.

In case of Chitwan district adequate knowledge was found high in the people who had never contact with influenza pandemic patients (54.1.%) whereas those people who had contact with influenza patients had high inadequate knowledge (52.5%)

The P value for the association between the level of knowledge and people who have ever contact with influenza patients was 0.0.486 which was not statistically significant.

Table 21: Relation between people contact with H1N1 patients and Level of Knowledge

		Yes	No	Total	χ2	P Value
Kathmandu	Inadequate	42(27.10)	26(45.60)	68(32.10)	6.55	**0.013**
	Adequate	113(72.90)	31(54.40)	144(67.90)		
	Total	155(100.0)	57(100.0)	212(100.0)		
Chitwan	Inadequate	21 (52.50)	79 (45.90)	100 (47.20)		

Adequate	19(47.50)	53(54.10)	112 (52.80)		
Total	40(100.0)	172(100.0)	212(100.0)	0.562	0.486

Protective behavior level

The questions regarding to the protective behavior were asked only to the person who have ever contacted with the influenza pandemic patients. Here these questions were asked to the 194 respondents of both districts consisting 155 from Kathmandu and 39 from Chitwan district. The mean score of the protective behavior was 20.68 and the value ranges from minimum 13 to Maximum 34. The range of the protective behavior was 21.

Relation between the districts and protective behavior

Out of the 155 respondents from Kathmandu and 39 respondents from Chitwan district most of the respondents had a bad protective behavior towards influenza pandemic A H1N1 with 80.4%. Very few percentages of the respondents 16.1% from Kathmandu and 33.3% of the respondents from Chitwan district had good practices. Here the p-value is 0.023 which is less than 0.05 so we can say that protective behavior is significantly associate with districts.

Table 22: Relation between districts and protective behavior

	Kathmandu	Chitwan	Total	$\chi 2$	P Value
Good	25(16.10)	13(33.30)	38(19.60)		
Bad	130 (83.90)	26(66.70)	156(80.40)	5.85	**0.023**
Total	155(100.0)	39(100.0)	194(100.0)		

Relation between the protective behavior and age

The table 23 reflects the relation between the protective behaviors with age groups. In Kathmandu district most of the respondents were ranged from 21 to 30 years of old and out of them very few 10.80% of the participants had good protective behavior towards influenza pandemic followed by 31 to 40 years of old with 23.50% good protective behavior. The P value 0.155 which was statistically not significant for the Kathmandu district.

For the Chitwan district most of the respondents who had exposed with PI patients were fell under the age group of 21 to 30 years old. Among them only 31.00% had good practices followed by 69.00% of bad protective behavior practices. Here the P value was 0.380 which shows statistically not significant.

Table no.23: Relation between age and protective behavior

		≤ 20 years	21- 30 years	31-40 years	>41 years	Total	χ2	P Value
Kathmandu	Good	0(0.00)	9(10.80)	8(23.50)	8(23.50)	25(16.1)	4.85	0.155
	Bad	4(100.0)	74(89.20)	26(76.50)	26(76.50)	130(83.90)		
	Total	4(100.0)	83(100.0)	34(100.0)	34(100.0)	155(100.0)		
Chitwan	Good	1(25.00)	9(31.00)	1(25.00)	2(100.0)	13(33.30)	3.681	0.304
	Bad	3(75.00)	20(69.00)	3(75.00)	0(0.00)	26(66.70)		
	Total	4(100.0)	29(100.0)	4(100.0)	2(100.0)	39(100.0)		

Relation between kind of hospitals and protective behavior

The table below reflects the relation between the kinds of hospital with protective behavior. If we see in the Kathmandu district most of the respondents of private hospital (28.6%) had good practices followed by public hospitals with 15%.. here the P value is 0.368 which is statistically not significant. While in case of Chitwan district 100% of the respondents from public hospital had good practices towards influenza pandemic preparedness followed by 41.7% on private hospitals. The P value is not significant at 0.05.

Table 24: Relation between kind of hospitals and protective behavior

		district	Public	private	Total	χ2	P Value
Kathmandu	Good	0(0.00)	21(15.00)	4(28.60)	25(16.10)	2.41	0.368
	Bad	1 (100.0)	119(85.00)	10(71.40)	130(83.90)		
	Total	1(100.0)	140(100.0)	14(100.0)	155(100.0)		
Chitwan	Good	6(24.00)	2(100.0)	5(41.70)	13(33.30)	4.71	0.102
	Bad	19(76.00)	0(0.0)	7(58.30)	26(66.70)		

Total	25(100.0)	2(100.0)	12(100.0)	39(100.0)	

Relation between the duration of works and protective behavior

The table 25 illustrates the association between the working years and protective behavior. Most of the respondents of Kathmandu district who had 17 to 24 years of working experiences had good protective behavior (36%) followed by 9 to 16 years of experience (25%).. Those people who had working experiences of below 8 years had high bad behavior (89.1%) The P value between these two variables was 0.012 which is statistically significant.

For the Chitwan district, the participants who had 9 to 16 years of working experience had high good knowledge (50%) but the bad knowledge was found among the working experience below 8 years. Here the P value is 0.633 which is statistically not significant between the working years with protective behaviors

Table 25: Relation between duration of works and protective behavior

		0 to 8	9 - 16	17-24	25-32	Total	$\chi 2$	P Value
Kathmandu	Good	12(10.90)	4(25.00)	9(36.00)	0(0.00)	25(16.10)	9.85	**0.012**
	Bad	98(89.10)	12(75.00)	16(64.00)	4(100.0)	130(83.90)		
	Total	110(100.0)	16(100.0)	25(100.0)	4(100.0)	155(100.0)		
Chitwan	Good	9(30.00)	3(50.00)	0(0.00)	1(50.00)	13(33.30)	2.08	0.633
	Bad	21(70.00)	3(50.00)	1(100.0)	1(50.00)	26(66.70)		
	Total	30(100.0)	6(100.0)	1(100.0)	2(100.0)	39(100.0)		

Relation between area of work and protective behavior

The table 26 shows the relationship between the area of working and protective behavior. In Kathmandu district 155 participants were involved from different wards of hospitals and out of them only 16.1% had a good protective behavior on the other hand majority of participants 83.9% had bad protective behavior. 75 Participants from adult ward were involved and out of them only 25.3% had a good protective behavior

followed by 74.7% had bad protective behavior. The P value shows the statistically significant association among the area of working and protective behavior of Kathmandu district.

Regarding the Chitwan district only 33.3% of the respondents who were working in different areas of hospitals had good protective behavior where as majority of them had a bad protective behavior. Here the P value was 0.246 which was not statistically significant.

Table 26: Relation between area of work and protective behavior

		Surgical	ICU	Adult	Child	Other	Total	$\chi 2$	P Value
Kathmandu	Good	1 (2.30)	0 (0.00)	19 (25.30)	3 (12.50)	2 (50.00)	25 (16.10)	19.46	**0.001**
	Bad	43 (97.70)	8 (100.0)	56 (74.70)	21 (87.50)	2 (50.00)	130 (83.90)		
	Total	44 (100.0)	8 (100.0)	75 (100.0)	24 (100.0)	4 (100.0)	155 (100.0)		
		Emergency	ICU	Adult	Child	Maternity	Total		
Chitwan	Good	1 (20.00)	3 (50.00)	7 (58.30)	2 (22.20)	0 (100.0)	13 (33.30)	7.40	0.246
	Bad +	4 (80.00)	3 (50.00)	5 (41.70)	7 (77.80)	4 (100.0)	26 (66.70)		
	Total	5 (100.0)	6 (100.0)	12 (100.0)	9 (100.0)	4 (100.0)	39 (100.0)		

+Anesthesia 1 and opt 2

Relation between PI guidance and protective behavior

The table 27 reveals the relationship between the influenza pandemic guidance and protective behavior. In the Kathmandu district the participants who are working in those hospitals which donot have influenza pandemic guidance had good practices in comparison to those hospitals who have PI guidance with 20.2% and 8.3% respectively. In Chitwan district also respondents of those hospitals who have IP guidance have low bad practices than those hospitals who do not have PI guidance with 27.3% and 35.7% respectively. Here both of the districts are not significant with the protective behavior.

Table no.27: Relation between PI guidance and protective behavior

		Yes	No	Not sure	Total	$\chi 2$	P Value
Kathmandu	Good	4(8.30)	21(20.20)	0(0.00)	25(16.10)	3.49	0.177
	Bad	44(91.70)	83(79.80)	3(100.0)	130(83.90)		
	Total	48(100.0)	104(100.0)	3(100.0)	155(100.0)		
Chitwan	Good	3(27.30)	10(35.70)	-	13(33.30)	--	0.719
	Bad	8(72.70)	18(64.30)	-	26(66.70)		
	Total	11(100.0)	28(100.0)		39(100.0)		

Relation between training and protective behavior

The table 28 reflects the relation between the people who ever received training and the protective behavior. In case of Kathmandu district good knowledge was found among the participants who did not receive the training rather than received the training (9.5). The significant value among these two variables is 0.223 which is not statistically significant. On the other hand the participants of Chitwan district who received the training had high good protective behavior than who did not receive the training with 35.3% and 31.8% respectively. In the Chitwan district the association between Training and protective behavior was strongly not significant.That means training only does not work to be protective from Influenza pandemic. The major thing was the protective equipments should be available during the outbreak period.

Table 28: Relation between training and protective behavior

		Yes	No	Total	$\chi 2$	P Value
Kathmandu	Good	4(9.50)	21(18.60)	25(16.10)	1.85	0.223
	Bad	38(90.50)	92(81.40)	130(83.90)		
	Total	42(100.0)	113(100.0)	155(100.0)		
Chitwan	Good	6(35.30)	7(31.80)	13(33.30)	0.052	1
	Bad	11(64.70)	15(68.20)	62(66.70)		
	Total	17(100.0)	22(100.0)	39(100.0)		

Relation between the people who ever contact with pandemic influenza patients and protective behavior

The table 29 illustrates association between the protective behavior and people who ever contact with pandemic influenza patients. In case of Kathmandu district, the

participants who had ever contact with IP patients had high bad protective behavior (83.9%) followed by 16.1% with good protective behavior. When we are looking the same findings for the Chitwan district we can find that people who had ever contact with influenza pandemic patients had high bad protective behavior with 66.7% followed by 33.3% good protective behavior.

Table.29: Relation between people contacted with H1N1 patients and protective behavior

		Yes	No	Total	$\chi 2$	P Value
Kathmandu	Good	25 (16.10)	-			
	Bad	130(83.90)	-			
	Total	155(100.0)	-			
Chitwan	Good	13(33.30)				
	Bad	26(66.70)				
	Total	39(100.0)				

Relationship between the practice and knowledge

The table 30 presents the relationship between the practice and levels of knowledge of both districts Kathmandu and Chitwan.

In Kathmandu district, those people who had adequate knowledge had good practices (22.1%) where as bad protective behavior was also found among the participants who had adequate level of knowledge. Here the protective practices are statistically significant with level of knowledge at 0.001.

In Chitwan district people who had adequate level of knowledge also had good protective behavior (31.6%) where as bad protective behavior was also found high among the participants who had adequate level of knowledge (68.4%) Here the significant value was 1 which was strongly statistically not significant. This finding also indicates that in Chitwan district knowledge of participants did not work while applying for protective measures. If they have knowledge but do not have protective measures how they can protect themselves from the influenza pandemic patients.

Table 30: Relation between knowledge and protective behavior

	Inadequate	Adequate	Total	$\chi 2$	P Value

Kathmandu	Good	0 (0.00)	25 (22.10)	25 (22.10)	11.07	**0.001**
	Bad	42(100)	88(77.90)	130(83.90)		
	Total	42(100.0)	113(100.0)	155(100.0)		
Chitwan	Good	7 (35.00)	6(31.60)	13(33.30)	0.051	1.00
	Bad	13(65.00)	13(68.40)	26(66.70)		
	Total	20(100.0)	19(100.0)	39(100.0)		

Analytical study (Student T test)

The association between the level knowledge and protective behavior was found by using Mann Whitney test.

1. Compare the knowledge and protective behavior according to district

A knowledge and protective behavior score was calculated to compare the knowledge and protective behavior according to district wise. The mean knowledge score of the Kathmandu district was 29.22 where as Chitwan district had 27.02. Here the knowledge score of the Kathmandu district was higher than Chitwan district but for the protective behavior Chitwan district had more score than Kathmandu district followed by 21.07 and 20.58 respectively. From the table below we can conclude that Kathmandu district had more knowledge score and Chitwan district had more protective behavior score

Table 31: Compare the knowledge and protective behavior according to district

	Kathmandu		Chitwan		P value
	Mean	SD	Mean	SD	
Knowledge score	29.22	3.69	27.02	5.46	**<0.001**
Protective behavior score	20.58	4.3	21.07	3.16	**0.001**

The relationship between general characteristics and knowledge and protective behavior score by using independent sample t test.

The table 32 reveals the relationship between general characteristics and knowledge and protective behavior score. In the table below mean and standard deviation was calculated by using the student T test to compare the value between the two districts (Chitwan and Kathmandu). Here age, types of hospitals, duration of works area of works, hospital guidance, formal infection training and contact with PI patients were the independent variables and the dependent variables were level of knowledge and protective behavior.

The mean knowledge score of the participants of Kathmandu and Chitwan district who had ever contacted with Influenza pandemic patients had higher knowledge than who did not ever contact with H1N1 patients. For both of cases the mean score was higher in Kathmandu district than in Chitwan district with 29.51, 28.12 and 28.43, 26.79 respectively. In case of protective behavior Chitwan district had higher score than Kathmandu district with 21.07% and 20.58% respectively.

A participants who were working in the hospitals of Kathmandu and have influenza pandemic guidance at hospitals had higher mean knowledge score than Chitwan district with 30.24% and 27.9% where as the mean protective behavior score was found high in Chitwan district. Form the table below we can see that level of knowledge of participants of Kathmandu district who received training had higher level of knowledge whether in case of protective behavior score it was high in Chitwan district.

Table 32: The relationship between general characteristics and knowledge and protective behavior

		Kathmandu			Chitwan		
		Mean score	SD	P	Mean score	SD	P Value
knowledge score with participants who ever contact patients and did not	Yes	29.51	3.8	**0.004**	28.12	5.01	**0.047**
	No	28.43	3.26		26.79	5.5	

contact patients

Protective behavior score with participants who ever contact with H1N1 patients*	Yes	20.58	4.35	-	21.07	3.16	-
knowledge score of participants with hospital guidances	Yes	30.24	2.85	**0.039**	27.9	5.79	0.254
	No	28.83	3.88		26.82	5.37	
Protective behavior score of participants with hospital guidances	Yes	20.37	2.21	0.734	20.45	2.01	0.449
	No	20.73	5.08		21.32	3.51	
knowledge score of participants who received training and who did not	Yes	29.26	2.65	0.906	27.01	6.49	0.956
	No	29.21	4		27.06	4.78	
Protective behavior score of participants who received training	Yes	19.69	2.78	**0.050**	21.23	2.077	0.722
	No	20.92	4.77		20.95	3.84	

*Only for those participants who ever contact with Influenza pandemic patients

Here the age group are merged into two groups (≤30 and above 30 years) because very low number of participants were fell under the age group below 20 and above 30 years of old

Age of the participant

Kathmandu	Mean	SD	P	Mean	SD	P Value
≤30 Years	28.91	3.82	0.137	19.35	2.78	**≤0.001**
Above 30 years	29.67	3.46		22.16	5.40	

Total	29.22	3.69		20.58	4.35	
Chitwan						
≤30 Years	26.78	5.49		21.03	3.25	
Above 30 Years	29.52	4.57	0.037	21.33	2.87	0.833
Total	27.04	5.46		21.07	3.16	

2. Relationship between the knowledge and protective behavior and type of hospitals and years of working

The table 33 reveals that mean knowledge score of all hospitals of Kathmandu district had 29.22 (P= 0.82) score where as for Chitwan district it was 27.04 (P=0.06). likewise the mean practices score of Kathmandu was 20.58 (P = 0.001) followed by 21.07 from Chitwan district (P= 0.18).

The mean knowledge and protective behavior score of the participants was categorized to identify the association with duration of working experiences and their knowledge and protective behavior. The participants who had 25 to 32 years of working experiences of Kathmandu district had more knowledge (P= 0.007) where as high protective score was among the people who had 17 to 24 years of working experiences (p=0.004). In case of Chitwan district the highest knowledge score was found among the participants who had 9 to 16 years of working experiences (P=0.168) followed by the protective score among 25 to 32 years of working experiences with 22.00 (P = 0.603). In both of the district the highest knowledge score and protective behavior score was found among the participants who were above 30 years of old.

Table 33: Relationship between the knowledge and protective behavior and type of hospitals

	Knowledge			Protective behavior		
Hospitals						
Kathmandu	Mean	SD	p	Mean	SD	P Value
TU teaching	29.29	2.99	0.820	18.36	2.20	**0.001**
Teku hospital	29.01	3.67		22.57	4.74	

Om Hospital	29.30	4.87		22.80	4.99	
Total	29.22	3.69		20.58	4.35	
Chitwan						
Bharatpur hospital	26.87	5.01		20.06	3.32	
CMC	27.20	5.89	0.060	22.08	2.60	0.189
Total	27.04	5.46		21.07	3.16	
Year of working						
Kathmandu						
0 to 8 years	29.30	3.47		19.93	3.20	
9 to 16 years	27.29	5.44		20.68	4.85	
17 to 24 years	29.87	2.56	**0.007**	23.40	7.07	**0.004**
25 to 32 years	33.00	.00		20.50	1.00	
Total	29.22	3.69		20.58	4.35	
Chitwan						
0 to 8 years	26.82	5.52		21.06	3.3	
9 to 16 years	30.41	3.98		21.50	1.7	
17 to 24 years	28.50	2.12	0.168	17.00	-	0.603
25 to 32 years	27.00	2.82		22.00	4.24	
Total	27.04	5.46		21.07	3.16	

Correlation:

Correlation between knowledge and protective score of Kathmandu and Chitwan district were calculated by using spearman's rho method which found the correlation value as presented in table below.

Table 34 correlation between knowledge and protective score of Kathmandu and Chitwan district

District	Knowledge	
	Correlation Coefficient	P value

Protective behavior	Kathmandu	0.106	0.191
	Chitwan	-0.77	0.642

Here the association between the protective behavior and knowledge had partial positive association for the Kathmandu district (r = 0.106) and it was statistically not significant with P= 0.191. But in case of Chitwan district the relationship between protective behavior and Knowledge were found as the Partial negative correlation (r = -0.77) with statically not significant P value.

Factors influencing knowledge and protective behavior

To identify the factors influencing knowledge and protective behavior of influenza pandemic a bivariate analysis was carried out by chi square test without split the district. For the knowledge level the independent variables which were statistically significant were: district (P = 0.001), Age (P = 0.050), kind of hospitals (P = 0.000), influenza pandemic guidances (P = 0.022) and contact with influenza pandemic patients (P = 0.005). From the below table we knew that district and kind of hospitals shows the strong association with level of knowledge. The factors which influenced protective behavior were district (P= 0.023), Duration of work (P = 0.044), area of working (P = 0.005) and level of knowledge (P = 0.053)

Table 35: Factors influencing knowledge and protective behavior

Variables	Knowledge		Protective behavior	
	$\chi 2$	P	$\chi 2$	P Value
District	10.09	**0.001**	5.85	**0.023**
Age	4.25	**0.050**	2.81	0.098
Kind of hospitals	18.42	**≤0.001**	4.96	0.074
Duration of work (fisher exact test)	1.80	0.625	7.65	**0.044**
Area of working	-	-	19.67	**0.005**
training	0.765	0.395	0.375	0.565

Guidance (Fisher exact test)	6.99	**0.022**	3.70	0.167
Contact patient	8.07	**0.005**		
Knowledge level	-	-	3.98	**0.053**

P value significant at ≤0.05

Multivariate

Multiple logistic regression analysis: associations of variables with Knowledge as dependent variables

The variables that were significant at the bivariate level at ≤0.15 were re-examined by controlling the other variables in the multivariate analysis in order to get the final model. Multivariate analysis was done by binary logistic model to find the strength of association between the general characteristics and the dependent variable (level of Knowledge only). In the multivariate model the variables which were again found to be significant for the level of knowledge were kind of hospitals (P = 0.003) and PI/hospital guidance (P = 0.013).

Table 36: Multiple logistic regression analysis: associations of variables with Knowledge as dependent variables

			95.0% C.I		P Value
	B	S.E.	Lower	Upper	
District	.186	.425	.524	2.768	0.662
Age	.181	.269	.707	2.031	0.503
Kind of hospital					**0.003**
Public Hospital	-.970	.291	.214	.671	**0.001**
Private hospital	.169	.412	.528	2.653	0.682
Guidance	-.644	.261	.315	.875	**0.013**
Contact patient	-.287	.250	.460	1.224	0.250

Multiple logistic regression analysis: associations of variables with protective behavior as dependent variables

In the multivariate analysis the variables which were considered to be the significant in bivariate at p value ≤ 0.15 for the protective behavior were included such as district, age, kind of hospitals, duration of works , area of working and level of knowledge. In the multivariate model district (P =0.001) and level of knowledge (P = 0.001) were found again statistically significant.

Table 37: Multiple logistic regression analysis: associations of variables with protective behavior as dependent variables

			95.0% C.I		P
	B	S.E.	Lower	Upper	
District	-1.829	.572	.052	.493	**0.001**
Duration of works	-0.279	.235	.478	1.198	0.234
Area of working					0.102
Level of knowledge	-1.897	.579	.048	.466	**0.001**

CHAPTER V:

Summary, Discussion, Conclusion and Recommendations

Summary

General characteristics

A total of 424 respondents from two districts (Kathmandu 212 and Chitwan 212) were involved in this study. Table 1 provides a number of respondents representing from each district. The majority of the respondents were aged between 21 to 30 years old (71.46%) followed by 31 to 40 years with 16.17%. The mean average year of working was 6.57 years of old. The average mean of working years of Chitwan district was 4.71 years where as Kathmandu district was 8.44 years. In terms of the area of working, majority of the respondents (36.57%) has been working in adult ward followed by child ward with 16.27%. In Kathmandu district most of the respondents has been working in adult ward (45.75%) followed by surgical ward (26.88%) whereas most of the respondents from Chitwan district has been working in adult ward, Emergency ward and Intensive care unit ward (ICU) with 27.37%, 24.53% and 18.39% respectively. Regarding the infection control training 26.88% of the respondents of Kathmandu district received the training on the other hand 36.79% of respondents from Chitwan district received the training towards infection control. The total respondents who respond that their hospital had influenza pandemic guidance or policies were 25.00% and 19.81% from Kathmandu and Chitwan district respectively.

0nly 46% of the respondents had ever contacted with influenza pandemic patient at hospitals. Majority of the respondents who had ever contact with influenza pandemic patients were from Kathmandu district (72.64%) and very few percentages of the respondents (19.81%) were from Chitwan district.

Knowledge assessment

The majority of the participants (62.23%) were aware that the pandemic was outbreak in Nepal in 2009. Most of the respondents of both districts Kathmandu (58.96%) and

Chitwan (66.5%) were well familiar with this date. More than 85 % of respondents had clear knowledge that pandemic is known as the worldwide influenza outbreak (Kathmandu 88.22% and Chitwan 83.98 %). Very few percentages of the participants (37.26%) knew the correct answer regarding the time that world had faced influenza pandemic outbreak in 20th century.

The majority of the participants (above 80%) were aware about the most correctly known signs and symptoms were fever, cough, sore throat, myalgia and fatigue. The least correctly known signs and symptoms were nose bleed, diarrhea, conjunctivitis, convulsion and mental confusion. The majority of the participants of both districts were aware that the disease was transmitted to a person by droplet sneezing (95.25%) and face to face talking with infected patients (65.57%). 0nly 40.09% of the respondents and 27.92% of the respondents know that contaminated surface touching and hand shaking with infected person were the other the way of transmission of influenza virus. 29.01 % participants (Kathmandu: 23.6 % and Chitwan 36.1%) mistakenly believed that Pandemic Influenza was spread by drinking water.The participants (87.50%) reported that regular hand washing, cover nose and mouth during sneezing (98.35%), Keep distance from infected person (89.86%), avoiding crowd (83.02%) and vaccination against pandemic influenza (79.95%) were important preventive measures to prevent from influenza pandemic transmission from human to human. The majority of the participants of Kathmandu district (85.37%) and Chitwan district (82.08%) had idea that children below five years were high risk group from influenza pandemic A H1N1 2009. Likewise 80.66% and 66.95% of respondents from Kathmandu and Chitwan district respectively knew that elderly people were also fall under the high risk group from Influenza pandemic. However 64.16% of participants mistakenly stated that Pandemic Influenza was a fatal contagious disease (Kathmandu 65.09% and Chitwan 63.21%).

The period of communicability is one day before start of symptoms to seven days after of symptoms which was known by equal percentage of the respondents of both districts (48%). However the majority of participants were not knowledgeable about infection control period, only 43.86% of respondents of Kathmandu district and 28.3% of respondents of Chitwan district knew the correct answer that infection control measure should be continued for seven days. Most of the participants 75.47%

and 80.19% from Kathmandu and Chitwan district respectively agreed that during the influenza pandemic period only one patient must have been hospitalized in one room.

Almost all participants from both district (Kathmandu 85.38% and Chitwan 93.54%) thought that difficult breathing and shortness of breath was worthy of an emergency situation which required urgent intervention and Hospitalization. Majority of the participants agreed that the wishes of the patient were not important to adjudicate emergency situation. Last but not least only 46% (Kathmandu district with 48.11% and Chitwan district with 43.87%) of the respondents knew the correct order of removing of contact precaution materials)

Protective behavior

The participants reported that to protect from the transmission of influenza pandemic patients they used every time masks (44.10%), gloves (40%), wash hands with chemical and soap (63.59%) wearing gown (23.08%) using goggles (12.08%). Regarding the personnel protective equipment that they used during different procedure we found that during the physical examination of patients most of the participants (>93%) of both districts used gown and gloves. Majority of the respondents from Kathmandu district replied that gown, gloves and surgical masks were the major precaution that they used while sit behind the patients and taking the history which was as same as the Chitwan district gown, gloves and surgical masks were the highly applied protective measure during the influenza pandemic outbreak situation. Most of the respondents 60.13% of the Kathmandu district and 75.00% of the respondents of Chitwan district had used masks first when they saw that pandemic influenza patients were coming near to them where as the second applied precaution was not shaking hands with 21.43% and 23.21% of Kathmandu and Chitwan district respectively. If we discuss about the separated situation of medical equipments of influenza pandemic patients with other patients we found that hospitals of Kathmandu used to separate the things rather than Chitwan district with 66.50% and 42.92% respectively whereas 27.12% of the respondents were not sure whether it was separated or not . Only 11.5% of the total respondents were vaccinated from seasonal vaccine and majority of the respondents (79.48%) were not vaccinated. 80% of

respondents of Kathmandu district and 75% of respondents from Chitwan district vaccinated from seasonal influenza vaccine respectively. In case of H1N1 vaccine only 11.56 % of the respondents were vaccinated from H1N1 vaccine comprising 9.72% from Kathmandu and 15.57% from Chitwan district.

Analytical test By Chi-square for Knowledge level

The mean knowledge score of the respondents was 28.134 which were ranges from the minimum of 1 to maximum of 39. Almost 40% of the respondents had inadequate level of knowledge followed by 60.4% had adequate knowledge (P=0.004). adequate knowledge was seen high in the age group above 30 years of old with 72.4% in Kathmandu district (P= 0.135) and in Chitwan district with 52.8% (P= 1). The participants who had less than 8 years of working experiences had high adequate level of knowledge than other groups with 68% and 52.6% of Kathmandu and Chitwan district respectively. Working area showed the not significant association with level of knowledge P=0.392 for Kathmandu and significant association for Chitwan district with P= 0.009 . Those people who received the formal infection training and those who did not receive had both high adequate and inadequate level of knowledge in Kathmandu district, and in case of Chitwan district the cases was same . The hospitals guidance and level of knowledge of participants from Kathmandu had found the statistically significant association (P = 0.004) on the other hand it was not statistically significant to Chitwan district (P=0.863). The participants who had ever contact with influenza pandemic patients of Kathmandu and Chitwan district had high adequate and low inadequate level of knowledge .

Analytical test By Chi-square for protective behavior

From the chi-square test we can see that districts were statistically association with protective behavior (P = 0.023). The high percentage of good protective behavior was found among the age above 31 years in Kathmandu district and age below 30 years in Chitwan district. The participants of Kathmandu and Chitwan district who had less than 8 years of working experiences had bad practices with 81.90% and 70.00% respectively . In Kathmandu district, the participants who had ever contact with Influenza pandemic patients had higher bad protective behavior (83.9%) followed by

16.1% with good protective behavior. On the other side people who had ever contact with influenza pandemic patients in Chitwan had higher bad protective behavior with 66.7% followed by 33.3% good protective behavior.

The level of knowledge of Kathmandu district had associated with preventive Behavior (P = 0.01) where as with Chitwan district it was strongly not significant (P= 1)

In terms of bivariate analysis, the result showed that general characteristics including district, age, kind of hospitals, hospital PI guidance and contact with PI patients were significant with the level of knowledge ($p \leq 0.05$) and the rest of the variables such as working duration, training were not found to be significant , On the other hand district and durations of working years were significant with the protective behavior at ≤ 0.05 .

Multivariate analysis: The result from logistic regression showed that only kind of hospitals and PI guidances were significant for the level of knowledge and district and level of knowledge were significant for protective behavior.

Discussion

Data assembled demonstrated that a high number of respondents had detailed understanding of most known sign and symptoms of Influenza pandemic which were fever, cough, Myalgia and fatigue with more than 70%. Specifically, the least correctly known signs and symptoms were nose bleed, conjunctivitis, convulsion and mental confusion which findings is similar to the study conducted by Fatiregun A.A and Olowookere SA regarding the influenza pandemic among senior health workers in southwest Nigeria. They found that Majority of nurses have good knowledge about the symptoms of Influenza Pandemic such as fever (73.5%), and runny nose (69.1%). The participants (87.50%) reported that regular hand washing, cover nose and mouth during sneezing (98.35%), Keep distance from infected person (89.86%), avoiding crowd (83.02%) and vaccination against pandemic influenza (79.95%) were important preventive measures to prevent from influenza pandemic transmission from human to human. This findings is also similar to the research entitled “An inquiry of knowledge, attitudes and practices against pandemic H1N1 influenza among Turkish

health care workers in Southeast of Turkey by Selda Aslan et al which findings revealed that the majority of the health care workers (65.0%) were aware that the virus was transmitted to a person by touching and 57.9% of them felt that droplets after coughing and sneezing was the other way of spread virus. 64.16% of the respondents of this study mistakenly believed that PI was fatal contagious diseases however a research by Selda aslant revealed that 93.2% of Health Care Workers stated that PI was contagious.

Especially there was no detailed understanding of the vehicles of transmission such as spreading the virus via drinking water. A high number of respondents had detailed knowledge about the period of communicability (when do could pandemic influenza become infectious), and emergency situation that required urgent intervention. However, it was disturbing to note that detailed questioning revealed gaps in knowledge about how long infection control measure should be continued and how many influenza pandemic patients should be hospitalized in a single room.

It is known that Influenza pandemic is easily transmitted from person to person but this infection can also be prevented by practicing good personal hygiene and wearing basic personal protective equipment (PPE) which are face mask, surgical masks, gloves, gowns, face shield, goggles and N-95 masks. Respondents in this study used gown, gloves and surgical masks to prevent from infection in each procedure like physical examination, Naso pharyngeal, Oro Pharyngeal swab and Nebulizations.

In this study only 7.11% of participant nurses were vaccinated against Influenza pandemic A H1N1, 2009 where as in a survey in Italy among the Italian health care workers reflected that 31.2 % Nurses were vaccinated against pandemic H1N1 influenza 2009 that is may be because of lack of availability of Pandemic Influenza vaccine in Nepal among the nurses.

In the present study 39.62% of respondents had inadequate knowledge and 60.4% had adequate knowledge where as the previous research by Salda et al in turkey demonstrated that 31.55% of participants had low knowledge, with 22.98% having high level of knowledge about pandemic H1N1 influenza. That is may be because of

selda et all included all the hospital's workers like health personal and non health personal in their study but in may study only nurses were involved.

The influenza attack rate among unprotected Health Care Workers might be approximately 60% higher than that of the general population, which would result in substantial absenteeism and morbidity (Wicker et al, Cooley et al, 2010). In this study protective behaviors were assessed where 80.40% of participants had bad protective practices with 19.60% had good protective behavior towards preventive measures from influenza pandemic.

Of interest, it was found in this study that formal infectious control training was statistically significant for level of Knowledge but not significant for protective behavior. Training and knowledge does not necessarily translate into good protective behavior about Influenza A (H1N1). This finding contradicted work done by Abbate *et al* who reported that respondents with good knowledge were those with good practices. (Abbate R, 2006.12.11).H ere the finding was not consistent with previous findings that is may be because the nurses of Nepal had knowledge but due to the lack of protective equipments may be they did not able to apply it during pandemic influenza outbreak period.

It was evident in this study that knowledge score was not positively correlated with practice score. Although people had high knowledge, they did not have good protective behavior. That was might be because they did not get enough equipment during the outbreak period. This suggested that good knowledge not only enable individuals to have good practice to protect them from Influenza pandemic A (H1N1). This finding concurs with findings reported by Yap et al and Keith Eastwood et al (Keith E, 2009)

Since health workers attend to various patients in their day to day activities there is a need to put preventive strategies in place to identify cases, protect staff and treat identified cases. This study showed that the health care workers interviewed demonstrated fair but incomplete knowledge about influenza A (H1N1). This finding is similar to the finding in Iran, in a similar study, which assessed the knowledge,

attitude and practices of health care workers to influenza infection. (Khazaeipour Z, 2010)

Hospitals with greater capacity will be expected to assess and give information to their personnel regarding important pandemic related issues. If Health Care Workers were to respond appropriately during an outbreak of infectious disease, nosocomial transmission of disease between people could be prevented. Many reports have highlighted various levels of knowledge towards infectious agents and the public behavior towards these infections, especially after avian influenza outbreaks (Balkhy HH, 2008)

The main recommended measures which need to be used in concert, are: 1) isolation and quarantine measures used 2) contact tracing and management, including the number of contacts under observation, their clinical status, and the date of the last known contact 3) infection control measures implemented in health care facilities 4) extent of animal culling, if any 5) use of antivirals for treatment or prophylaxis 6) border controls and travel restrictions, if any 7) risk communication activities 8) estimates or indicators of effectiveness of containment and 9) lessons learned (World Health Organization.2009 Global surveillance during an influenza pandemic)

Conclusions

Nurses have been identified as the priority group whose preparedness is a critical element in the response to the pandemic outbreak situation. Further spread of viruses is a major problem during a pandemic and practices about the protective measures that could be taken to reduce risk of transmission and infection is crucial. For that efforts should be targeted at educating Nurses to improve knowledge and protective responses in the future outbreak of pandemic. Most of the participants were well familiarized with the major signs and symptoms of influenza pandemic but they were not familiarize with the minor signs and symptoms, like wise some staff nurses also did not have idea about the mode of transmission and prevention methods. Although the mean score of the knowledge level was high among the participants but the

protective score was quite low, that is may be because of lack of protective stuffs (face shield, goggles, and masks) during the outbreak of influenza pandemic. Most of the participants were not familiar with the incubation period, method of removal and uses of personal protective equipment (PPE). Very few numbers of participants were vaccinated with influenza pandemic vaccine as well as seasonal vaccine. Only around 50% of the respondents respond that that they want to work during future pandemic outbreak time and majority of the respondents (80%) did not think that nurses were protected from transmitting of influenza pandemic from patients during the influenza pandemic time. Among those respondents who had exposed with Pandemic influenza patients only 46% felt that they were protected when they had contacted with influenza patients and majority of the remaining participants did not think same way..

This study indicated that most of the participating staff nurses had an inadequate knowledge and bad practices towards influenza pandemic. This research found knowledge score was high in the Kathmandu district and preventive behavior score was high in Chitwan district and the correlation between the score of knowledge and protective behavior was statistically not significant. This study may contribute positively to the refinement of the influenza pandemic preparedness plans and programmes. Last but not least this study has revealed important gaps in the staff nurses knowledge as well as revealing some of the malpractices and behaviors towards influenza pandemic.

The results of the this survey illustrate a range of knowledge and self reported behavioral patterns concerning Influenza pandemic among a sample of an staff nurses from some hospitals of Kathmandu and Chitwan districts, Nepal. This study examined the levels of knowledge and protective behavior towards the influenza pandemic and should provide technical support to support hospital administration in developing hospitals guidance and policies as well as health education campaigns and training to prevent transmission of influenza pandemic.

Recommendations

1. Policy level and hospitals

1.1 Most of the participants were well familiarized with the major signs and symptoms of influenza pandemic but they were not familiarize with the minor signs and symptoms, like wise some staff nurses also did not have idea about the mode of transmission and prevention methods so it would be better if hospitals as well as ministry of health and population enhanced their level of knowledge towards pandemic influenza including signs and symptoms, mode of transmission and preventive methods.

1.2 Although the mean score of the knowledge level is high among the participants but the practices score was quite low, that is may be because of lack of protective stuffs (face shield, goggles, masks) so Nepal government ministry of health and population should provide the necessary equipments to prevent from the transmission of Influenza pandemic.

1.3 Most of the participants were not familiar with the incubation period, method of removal of PPE and uses of PPE so it would be good to educate the nurses with correct information on disease incubation period and method of uses of Personal protective equipment which will influence their level of knowledge.

1.4 Healthcare Workers should be offered the vaccine against the pandemic influenza strain when the vaccine becomes available.

1.5 Occupational health and infection prevention and control measure should be included in the influenza pandemic guidances and during the outbreak situation it should be followed by the hospitals as well as staff nurses

1.6 Hospital administration should make efforts to build up adaptive behavioral changes among nurses and encouraging them to stay protective during early stages of any outbreak of pandemic.

1.7 Only around 50% of the respondents respond that that they want to work during future pandemic outbreak time, so it would be good to assure them about their protection from influenza pandemic transmission during the outbreak situation.

1.8 Majority of the respondents (80%) did not think that nurses are protect from transmitting of influenza pandemic from patients and those respondents who had exposed with patients only 46% felt protected when they had contact with influenza patients so hospitals must have to assure the staff nurses' to work in future outbreak by providing adequate knowledge and protective stuffs

1.9 This study indicated that most of the participating staff nurses had an inadequate knowledge and bad practices towards influenza pandemic. There is therefore, a need to provide comprehensive information to staff nurses on the influenza pandemic by scaling up information about the disease information sources that are most accessible

1.10 The hospital should exploit the awareness for health promotion purposes. Educating the nurses with correct information on disease transmission and preventive measures for Influenza pandemic is important as it will influence their knowledge.

1.11 Occupational health and infection prevention and control should follow the precautionary principle and the recommendations or findings presented in the scientific literature to ensure staff safety during an influenza pandemic outbreak. A comprehensive approach to staff safety should be considered when planning for such an event. Even though all preventive cautions are taken, patients will be best cared for when HCWs are convinced that everything possible is being done to protect their own health as well (Chironna et al., 2010). For these reasons, HCWs should be educated before any type of pandemic.

2. Further research

This study was the cross sectional study conducted within the limited time period which may not have been able to assess the factors association between the knowledge and protective behavior. Participants had a higher knowledge score but lower protective behavior score, whether participants received and did not receive the infectious control training, it does not matter on their knowledge level. Because of these reasons in depth study on this regard is necessary to carry out. Thus future study with different study design should be considered

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APPENDICES

APPENDIX A: Questionnaire

Part 1 : General Characteristic

1. How old are you?	1.Below 20 years	☐	2. 21 to 30 years	☐
	3.30 to 40 years	☐	4. Above forty years	☐
2. What kind of hospital is this?	1. Community	☐	2. District hospital	☐
	3. Public Hospital	☐	4. Private hospital	☐
3. Since how many years you have been working in this job?	…….			
4. **In which area do you work most?**	1. Anesthesia	☐	2 Emergency	☐
	3. ICU	☐	4. Adult ward	☐
	5. Child wards	☐	6. Outpatient clinic	☐
5. Have you received any formal infection control training within last 3 years?	1. Yes	☐	2. No	☐
6.In your hospital do they have the influenza pandemic guidance or policies?	1. Yes	☐	2. No	☐
7 Do you have ever contact with Influenza Pandemic H1N1 patient at hospitals	1. Yes	☐	2. No	☐

Part 2: Knowledge about pandemic Influenza

1. In Nepal, The first cases of Influenza Pandemic was found in	1. 2005	☐	2. 2008	☐
	3. 2009	☐	4. 2010	☐
2. Pandemic is known as the……. Outbreak of infections or disease	1. Community	☐	2. District	☐
	3. Nation	☐	4. Worldwide	☐
3. How many time that the world has faced Influenza Pandemic outbreak in 20th century	1. Four	☐	2. Three	☐
	3. Six	☐	4. Five	☐

4. What are the signs and symptoms of pandemic influenza? (please answer each questions with yes or no option)	**Yes**	**No**	**Not sure**
Fever			
1. Runny nose			
2. Nose bleed			
3. Sore throat			
4. Loss of appetite			
5. Headache			
6. Diarrhea			
7. Backpain			
8. Cough			
9. Myalgia			
10. Fatigue			

11. Rhinitis			
12. Conjuntivitis			
13. Nausea			
14. Convulsion			
15. Arthralgia			
16. Mental confusion			
5. What is the mode of transmission of Influenza Pandemic? (please answer each questions with yes or no option)			
1. Contaminated surface touching			
2. Droplets sneezing			
3. Face to face talk (within 1 M)			
4. Hand shaking			
5. Mosquito bite			
6. Food			
6. Can pandemic H1N1 influenza be spread by drinking water? (please answer with yes or no option)			
7.What are the preventive measures of Influenza Pandemic (please answer each questions with yes or no option)			
1. Regular hand washing			
2. Cover nose/mouth during sneezing			
3. Keep distance from H1N1 patients			
4. Avoid crowd			
5. Vaccination			
6. Drinking Boiled water			

8.Who are known as the high risk group from Influenza Pandemic (please answer each questions with yes or no option)			
1. Children > 5year			
2. Elderly people			
3. Pregnant women			
4. Chronic patients			
5. Adult people			
9. Is Influenza Pandemic vaccine is effective measure against Influenza Pandemic?			
10. All patients with pandemic influenza must have been hospitalized (choose the correct answer)			
11. Is influenza pandemic is a fatal contagious diseases ?			

12. When do could pandemic influenza become infectious

1. Until sign and symptoms are starting ☐
2. Not infectious ☐
3. One day before start of symptoms to seven days after start of symptoms ☐

13. How long should infection control measure be continued?

1. Seven days ☐
2. It doesnot matter ☐
3. As long as symptoms continue ☐

14. During Influenza Pandemic outbreak situation, if possible how many people

1. One patient ☐
2. Three patients ☐

must have been hospitalized in one room? (choose only one)	3. More than three patients	☐
	4. It does not matter	☐
	5. Others	
15. What are the situations that required urgent intervention?	1.Difficult breathing and shortness of breath	☐
	2.Mental confusion	☐
	3. Frequent and prolonged vomiting	☐
	4. A wish of the patient	☐
16.What is the order of removing contact precaution materials? Choose the correct ranking?		
1.Gloves removed firstly, later lab coat is removed	1.5,4,3,1,2	☐
2.Hands are washed or rubbed with hand disinfectant	2. 2,1,3,4,5	☐
3.Glasses are removed	3.1,2,3,4,5	☐
4.Mask is removed	4. 3,4,1,2,5	☐
5.Hands are washed once again or rubbed with hand disinfectant		

Part 3: Protective Behaviors at hospital

All the questions (questions number 1 to 6) of part 3 are related to your protective practices during influenza pandemic H1N1, 2009 outbreak in Nepal. And last 2 questions are related to willingness to work as the nurses during future influenza pandemic Please understand the questions and tick the correct answer according to your practice at that time

1. Have you use following Personal protective equipment during Influenza pandemic outbreak time to protect from transmission of Influenza Pandemic, if yes tick the frequency

Some time: It refers that nurses used personal protective equipment while contacting pandemic patients but they did not use the equipments every time and for ev

Often: It refers that nurses used personal protective equipment frequently while exposing to the PI patients but due to some causes they very rarely they did not use it.

Every time It refers that every time nurses used personal protective equipment while examining and contacting with every pandemic influenza patients

Never It refers that nurses never used personal protective equipments while Contacting and examining Influenza pandemic patients.

PPE		Yes			No
		Sometime	Often	Every time	Never
1	Using masks				
2	Using gloves				
3	Wash hands				
4	Wearing gown				
5	Goggles				

2. For each procedure you performed for a patient with Influenza Pandemic patient check the personal protective equipment you regularly used

	Gown	Gloves	Surgical	Cloth	N95	Face	Goggles

			masks	masks	masks	shield	
Physical examination of patient							
Sit behind the patient and taki history							
Naso pharyngeal swab							
Oro pharyngeal swab							
Nebulization							

3. During the period of Influenza Pandemic outbreak in 2009 which preventive measure you had applied first when Influenza Pandemic patients were came near to you (chose only one)	**1.** Frequent Washing Hand ☐ **2.** Usage of Masks ☐ **3.** Not shaking hands ☐ **4.** Do not touch surface that are contaminated ☐		
Question numbers from 4 to 8 are related to your practice. Please tick one option from yes or no)	**Yes**	**No**	**Not sure**
4. During the 2009 Pandemic influenza outbreak situation at your hospital, had the patient's medical equipment separated from other patient's medical equipment?			
5. Did you feel protect yourself while you had contacted with Influenza pandemic patients at that time?			
6. Have you taken up seasonal influenza vaccine since July, 2009?			
7. Have you taken up influenza A (H1N1) vaccine after the influenza outbreak in 2009			
8. Do you think Nurses are protected from transmitting of Influenza Pandemic from Inflrunza pandemic patients			

9.In the future do you want to work at hospital during inluenza pandemic outbreak situation			

APPENDIX B: Budget

S.N	Activities	Cost in Bath
1	**Orientation to assistant researcher**	2500
2.	**Pre test**	
2.1	Questionnaire print and photocopy	500
2.2	Local transportation	2000
2.3	Rapport buildup and Loading fooding	3000
3	**Data collection**	
3.1	Photocopy Questionnaire	5000
3.2	Transportation cost	5000
3.3	Lodging and fooding	7000
3.4	Assistant Researcher incentive (4 people* 5days*1000Bath)	20000
3.5	Cost for communication/telephone/fax	1000
4	**Ethical clearance**	5000
5	**Data entry and process**	4000
6	**Document printing**	
6.1	Paper + printing	5000
6.2	Photocopy	2500
6.3	Stationary	1000
6.4	Binding paper (Exam)	1000
6.5	Binding Paper (Submit)	1500
6.6	Souvenir for respondent	6000
7	**Publication**	3000
8	**Miscellaneous**	5000
	Total	**82,000**

APPENDIX C: Work plan

Research process/ activities	2011					2012				
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Background Research question formulation and literature review										
Proposal writing										
Formatting of measurement tools (questionnaire)										
Proposal Examination										
Ethical approval										
Field work: data collection										
Data analysis										
Report writing										
Thesis defense										

Appendix D: Cronbach alpha result

Reliability test

Case Processing Summary			
		N	%
Cases	Valid	33	23.4
	Excluded[a]	108	76.6
	Total	141	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.781	46

ANOVA with Cochran's Test						
		Sum of Squares	df	Mean Square	Cochran's Q	Sig
Between People		63.250	32	1.977		
Within People	Between Items	348.967	45	7.755	532.834	.000
	Residual	623.598	1440	.433		
	Total	972.565	1485	.655		
Total		1035.816	1517	.683		
Grand Mean = 1.6983						

Appendix E: Results

The fistt case of Pandemic infleunza was found in Nepal in…

	Kathmandu		**Chitwan**		**Total**	
	N	%	N	%	N	%
2005	10	4.71	22	10.37	32	7.54
2008	61	28.77	28	13.20	89	20.99
2009	125	58.96	141	66.50	266	62.73
2010	16	7.56	21	9.93	37	8.74
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100.00**

Pandemic is known as the outbreak of

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Community	13	6.13	8	3.77	21	4.95
District	1	0.47	9	4.24	10	2.35
Nation	11	5.18	17	8.01	28	6.62
Worldwide	187	88.22	178	83.98	365	86.08
Total	**212**	**100.00**	**212**	**100.00**	**424**	**100.00**

In 20th century how many times the world has faced pandemic influenza outbreak

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Four	91	42.92	53	25	144	33.96
Three	67	31.6	91	42.94	158	37.26
Six	26	12.26	44	20.75	70	16.52
Five	28	13.22	24	11.32	52	12.26
Total	212	100.00	212	100.01	424	100.00

Influenza pandemic vaccine is effective measure against influenza pandemic

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Yes	132	62.30	141	66.50	273	64.38
No	23	10.80	25	11.80	48	11.32
Not sure	57	26.90	46	21.69	103	24.29
Total	212	100.0	201	94.8	424	100

Patients with pandemic influenza must have been hospitalized

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Yes	86	40.60	94	44.40	180	42.46
No	85	40.10	76	35.80	161	37.97
Not sure	41	19.30	42	19.80	83	19.57
Total	212	100.0	212	100.00	424	100.00

Influenza pandemic is a fatal contagious disease

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Yes	138	65.10	134	63.21	272	64.15
No	41	19.30	53	25.00	94	22.16
Not sure	33	15.60	25	11.79	58	13.69
Total	212	100.0	201	100.00	424	100.00

When do pandemic influenza become infectious

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Until sign and symptoms are starting	86	40.60	91	42.9	177	41.74
Not infectious	23	10.80	19	9	42	9.90
One day before start of symptoms to seven days after start of symptoms	103	48.60	102	42	205	48.34
Total	212	100.00	212	100	424	100.00

How long should infection control measure be continued

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Seven days	90	42.50	60	28.30	150	35.37
It does not matter	5	2.40	14	6.60	19	4.48
As long as symptoms continue	117	55.10	125	58.96	242	57.05
Total	212	100.0	212	100.00	424	100.00

People must have been hospitalized in one room

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
One patient	160	75.50	155	73.11	315	74.29
Three Patients	27	12.70	18	8.50	45	10.61
More than 3 patients	12	5.70	7	3.30	19	4.48
It does not matter	13	6.10	32	15.09	45	10.61
Total	212	100.00	212	100.0	424	100.00

Situation that required urgent intervention

	Kathmandu		Chitwan		Total	
	N	%	N	%	N	%
Difficult breathing and Shortness of breath	181	85.40	185	87.26	366	86.32
Headache	11	5.20	5	2.35	16	3.77
Nausea	10	4.70	1	.47	11	2.59
A wish of patients	10	4.70	21	9.90	31	7.31
Total	212	100.00	212	100.00	424	100.00

Appendix F: Biography

Name	Neupane Ramesh
Date of birth :	1985/Sep/06
Permanent address	Bharatpur- 13, Chitwan Nepal
Marital status	Single
Contact details	✉ rameshneup@gmail.com

Education

Degree	College/ University	Year
Master of Public Health (MPH)	College of Public Health Science, Chulalongkorn University, Bangkok Thailand	2011 to 2012
Bachelor in Public Health (BPH)	Hope International College (PU) Lalitpur, Nepal	2005 to 2008

Professional experiences

Key Experiences	Organizations	Duration
Program Officer, WASH Life saving program funded by UNICEF	Nepal Red Cross Society, Disaster Management, National Hq Kathmandu	April 2010 - May, 2011
District Communication and Training Officer, Humanitarian Pandemic Preparedness (H2P) Project	Nepal Red Cross Society, Kathmandu district chapter	January, 2009 - March, 2010