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Revisiting Vaccine Hesitancy, Barriers and Motivators to Obtaining a Flu Vaccine in a New COVID-19 Pandemic World

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Abstract

Purpose

To describe and compare patient perceived barriers and motivators and decision-making conflict between two groups of hospitalized patients, those who receive flu vaccines and those who do not.

Data Sources

Data collection during 2003 included extracting data from databases and mailing two surveys to 436 discharged patients. One hundred eight (108) patients participated in the study.

Conclusions

Top barriers included fear of side effects from vaccine (35%) and fear of contracting the flu (30%). Top motivators for obtaining a flu vaccine included previous vaccination (93%) and provider recommendation (62%). Barriers, motivators and patient decisional conflict differed depending upon patient vaccination status.

Implications for Practice

Given the potential negative consequences of contracting the flu, prevention is the best strategy. Prevention is contingent upon motivating patients to obtain an annual flu vaccine. Recommending flu vaccinations, offering vaccinations in convenient locations free of charge and discussing perceived barriers with patients may increase vaccinations among high-risk patients. Helping to clarify the advantages and disadvantages from the patient's perspective may decrease decisional conflict and increase vaccination rates.

Key words: Vaccine Hesitancy, Barriers, Motivators, Flu Vaccine, COVID-19 Pandemic, Patient Decision-making

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Health care professionals are accountable for ensuring the delivery of high quality health care to their patients. During flu season this means they work diligently to promote flu vaccinations, especially among their high-risk patient populations. While there is little disagreement among health care professionals as to the benefits of annual flu vaccines, there is disparate information, crisscrossing a number of studies, about promoting flu vaccinations. In addition, many vaccine-promoting strategies have demonstrated a negligible impact upon vaccination rates. This article presents research findings to facilitate health care professional decision-making regarding strategies to improve vaccination rates. Specifically, it describes flu vaccination barriers and motivators and patterns of decision-making among high-risk patients.

Background

Vaccine-preventable deaths due to influenza and pneumonia occur every year. Annually, influenza and influenza complications are responsible for 10 to 40 thousand deaths in the United States. Ninety percent (90%) of deaths occur in persons 65 years or older ("Influenza and pneumococcal", 2002). Influenza morbidities also account for significant numbers of outpatient visits. Unfortunately, immunization rates for high-risk patient groups run as low as 34-50% ("Missed opportunities", 1997; Chan-Tack, 2001; Green, 2000).

Influenza Vaccinations

Influenza vaccines are recommended for high-risk groups including children from six to -35 months, adults 65 or greater in age, people with heart disease, lung disease, kidney disease, diabetes and immunosuppressive diseases ("Missed opportunities", 1997; Chan-Tack, 2001). In addition to preventing deaths, influenza vaccines have been demonstrated to be 50% - 79%

effective in preventing hospitalizations (Furey, Robinson & Young, 2001; "Influenza: Immunization," 1997). Flu vaccines have also been associated with significant reductions (17%) in outpatient visits (Nichol et al, 1996).

As well as improving patient mobidity and mortality, significant cost savings have been demonstrated. In one study the direct net hospital cost savings averaged $73 for vaccinated patients, with high risk patient costs savings of $166 per patient (Nichol, Wuoerenma & von Sternberg, 1998). Baker, McCarthy, Gurley and Yood (1998) documented up to $735 per patient in hospital cost savings.

Various approaches have been used to increase the number of persons vaccinated for influenza, often with minimal success. For example, Baker et al. (1998) mailed three different types of patient reminders to three groups in order to compare responses among groups. One group received a generic message postcard, another received a personalized postcard, and a third group recieved a personalized tailored letter. The personalized tailored letter demonstrated only a 45.2% vaccination rate, followed by the personalized postcard at 44.7%, generic postcard at 43.5%, and finally, a control group (no intervention) at a comparable rate of 40.6% ($p<.0001$).

Patient Decision-making and Influenza Vaccinations

Patients deciding to obtain a flu vaccination can be viewed as voluntarily participating in a health-promoting behavior. However, not all patients follow advice (Davis et al. 2002; Russell, Daly, Hughes & Hoog, 2003). According to Pender (1987) and others (Begue & Gee, 1998; Green, 2000; "Reasons reported", 1999; O'Connor, 1995), a number of health promotion factors (cognitive-perceptual factors and modifying factors) lead up to the decision to actually engage in the health promoting behavior (see Figure 1).

Cognitive-perceptual factors. A number of cognitive-perceptual factors have been associated with flu vaccination rates. Classifying patients into high-risk groups has historically been important for targeting patients for vaccinations. It is assumed that if patients perceive they are high risk they will decide to engage more frequently in health promoting behaviors. But from a patient perspective, while there may be an awareness of the meaning of high risk, the majority of these patients do not consider themselves personally to be a member of this group and therefore do not self identified for flu vaccinations (Gene et al., 1992; Hutchinson & Norman, 1995). In addition, perceived lack of interest by a primary physician (Buffington & LaForce, 1991) has been a reported perceptual factor associated with lower vaccination rates.

Patient knowledge, a cognitive factor, can also affect decision-making. A Medicare Beneficiaries patient interview study concluded, “not knowing the vaccination was needed" was the most reported reason (barrier) for not obtaining a influenza vaccination (“Reasons reported”, 1999).

Modifying factors. Research to date provides mixed results regarding demographic modifying factors such as gender, race and ethnicity to flu vaccine rates. For example, Black et al. (1993) found that men were more likely to respond to a public health nurse educational intervention than women. By contrast, Gene et al. (1992) found that male flu vaccination rates actually decreased with personal physician recommendations.

In terms of race and ethnicity, Non-Hispanic blacks, Hispanics and other ethnic groups (Asian and American Indian groups) had lower vaccination rates than whites, with non-Hispanic blacks being the lowest (45.8%) (“Missed opportunities”, 1997). Baker et al.'s (1998) study also found significant differences in vaccination rates between two ethnic groups (72.9% Non-

Hispanic white versus 24% African American). Among seniors, only 43% of Hispanics and 50% of Blacks were vaccinated (“Researchers examine”, 2003).

Behavioral factors such as previous experience with health promoting actions have impacted vaccination rates. Watkins (1997) demonstrated that experience with being vaccinated ("receives vaccine each year") accounted for 40.9% of all doses given during the study period. Moran, Nelson, Wofford, and Velez (1996) also found that a positive immunization history contributed to increased vaccination rates (44% versus 19%).

Findings concerning interpersonal factors have been mixed. Increased vaccination rates were demonstrated with one-to-one physician or nurse recommendations (“Researchers examine”, 2003; Russell et al., 2003), family opinions (Gene et al., 1992), being convinced of the seriousness of influenza by others (“Researchers examine”; Buffington & LaForce, 1991; Carter, 1992; Watkins, 1997), and personalized letter reminders from their physicians (Baker et al., 1998). However, as previously mentioned, Gene et al (1992), did not find increased rates among men when personalized recommendations were made by physicians.

A number of situational factors found to contribute to increased flu vaccination rates. These comprise convenient vaccination scheduling (Begue & Gee, 1998), available health center vaccination information (Gene et al., 1992), convenient locations to obtain vaccinations, including home (Hughes & Tartasky, 1996), and no or low cost vaccinations among the elderly population (Nexoe, Kragstrup, & Ronne, 1997; Satterthwaite, 1997).

Decision-making process. Patient decision-making directly affects the likelihood of engaging in health promoting behaviors. Decisional uncertainty has been used as a model to examine decision-making regarding obtaining flu vaccinations. Decision uncertainty, factors contributing to uncertainty, and perceived effective decision-making have been demonstrated to

affect the likelihood of obtaining flu vaccines (O'Connor, 1995). Additional factors contributing to decisional conflicts include a lack of information about alternatives and consequences when selecting alternative behaviors, unclear values, emotional distress, skill deficits in decision making, and pressures from "important" others who are imposing conflicting views (O'Connor, 1999). Research has demonstrated "declines" in uncertainty when patients experience "declines" in a) feeling uniformed, b) being unclear about personal knowledge, and c) feeling unsupported in decision making. In addition, perceived effective decision-making (defined as being informed, consistent with personal values, and acted upon) was negatively correlated to uncertainty (Pearson r = -0.46 to -0.58).

Historically, many strategies have been attempted to increase influenza vaccination rates. The fact remains that many people in the US do not engage in life-saving, health promoting behaviors such becoming vaccinated for influenza. While single studies have investigated specific strategies to promote flu vaccines with varying success rates, a comprehensive research study has not been conducted to describe and compare motivators, barriers, and decision-making between vaccinated and non-vaccinated high-risk patients.

Design

A descriptive comparative design was utilized to address the specific aims for this study. Aims were to 1) describe patient flu vaccination histories; 2) describe patient perceived barriers and motivators to obtaining flu vaccinations; 3) describe patient decision-making conflict regarding obtaining vaccinations; and, 4) compare perceived barriers/motivators and decision-making conflict between patients who did and did not receive flu vaccines. The study was IRB approved by the Internal Review Board and investigators were certified in human subjects protection.

Population, Sample and Setting

The high risk patient population chosen for this study were patients hospitalized with ICD-9 codes specified by the Centers for Disease Control and Prevention for flu, pneumonia, and upper respiratory diagnoses (382, 481, 485, 486, 3841, 4801, 4808, 4809, 4820, 4821, 4822, 4829, 4830, 4870, 5109, 5111, 5130, 48231, 48232, 48281, 48282, 48283) during a single year's flu season. Retrospectively, these patients represent high risk, vulnerable patient groups ("Missed opportunities", 1997). In otherwords, these are the patients who potentially would benefit the most from obtaining a flu vaccine during the flu season, a target population of much interest to NPs.

The convenience sample of 436 patients was from one not-for-profit hospital located in Southern California. All patients discharged from this hospital with the identified ICD-9 codes were asked to participate in the study. Data was collected in 2003.

Instruments

Two data collection instruments were utilized for this study.

Flu Vaccination Survey. The investigative team designed a survey to capture flu vaccination barriers/motivators (see Table 1), perceived health and medical risks [i.e. , Do you consider yourself in a high risk group (having a medical condition) needing a flu vaccine?] as well as patient demographics (ethnicity, highest level of education, geographic location) (Cobler & Mayo, 2002). A review of the scientific literature regarding influenza vaccination patient barriers/motivators assisted in generating the barrier and motivator survey items. The barriers/motivators section of survey consisted of yes/no response options. Demographic item responses were either categorical or Likert format. Psychometric testing of the barrier/motivator portion of this new instrument is planned for a future study.

Decisional Conflict Scale (DCS). This instrument measured patients' degree of uncertainty about the course of action to take. This uncertainty can arise because of factors inherent in the decision itself (uncertainty about the outcome and the need to make value trade-offs between benefits and risks) and potentially modifiable factors (inadequate knowledge, unrealistic expectations, unclear values and norms, and inadequate support).

The DCS is a 16-item scale consisting of five subscales: Certainty (Items 1- 3); Feeling Informed (Items 4-6); Clear Values (Items 7-9); Feeling Supported (Items 10-12); and Quality of the Decision (Items 13-16). Individual items are measured on a 5-point Likert format. Scale anchors range from 1 (low decisional conflict) to 5 (high decisional conflict). Items are summed and averaged. Scores of 2.0 or lower are associated with those who move to action and scores of 2.5 or greater are associated with those who delay decisions. DCS reading level is at grade 8.

The DCS has undergone extensive psychometric testing for validity and reliability. DCS test-retest coefficients and alpha coefficients are > 0.80 (N>1000). It discriminates between those delaying and making decisions and between decision aids and usual care interventions (especially the Informed Subscale). Instrument testing has been done regarding a number of decision contexts (i. e., flu vaccination, breast screening, prenatal testing, hormone replacement therapy, treatments for lung cancer, heart disease, and atrial fibrillation). Pre and post studies that have tested decision support interventions demonstrate change in both total scale as well as subscales (effect size ranges from 0.40 to 1.2 for the total scale). Decision-making regarding flu vaccines has been tested in three populations: health science students (effect size 0.82), health care employees (effect size 0.62), and cardiac/respiratory patients (effect size 0.62) (O'Connor, 1999).

Methods

Mailed surveys and organizational databases generated the data for this study. Using a hospital informational database and ICD-9 codes, data was retrieved for patient medical record numbers, patient names and mailing addresses, diagnoses, admit and discharge dates and comorbidities. An organizational demographic information system was used to obtain patient age, gender, marital status, and payor.

The Flu Vaccine Survey and Decisional Conflict Scale were mailed to all 436 patients. Data were collected on 1) patient demographics and perceived barriers/motivators regarding flu vaccination as measured by the Flu Vaccination Survey (Cobler & Mayo, 2002) and 2) patient decision-making conflict regarding obtaining flu vaccines as measured by the Decisional Conflict Scale (O'Connor, 1999). Opt out postcards were included with the mailing. Patients not returning either the survey or the postcard (indicating they did not wish to participate) within three weeks of the mailing received a reminder phone call to complete both surveys.

Returned surveys were scanned into an Excel database and analyzed using SPSS version 11.5.0 (2002). Descriptive statistics were used to identify aggregate sample characteristics and motivators, barriers, and decision-making.

Correlational statistics such as chi-square, phi, and Pearson's correlation were used to describe relationships among patient characteristics, vaccination status, motivators, barriers, and decision-making. T-tests for independent samples were used to determine differences between the two groups of patients (vaccinated and non-vaccinated) on select study variables and DCS subscale scores (Munro, 2001).

Findings

A sample size of 108 patients (25%) was attained for this study (see Table 2). Approximately half of the participants were male. The mean age was 66.3 years. While four ethnic backgrounds were represented, the sample was predominately Caucasian (89.6%). Over 60% of the participants were either high school graduates (31.5%) or had some college (30.9%). Self-rated health ranged from poor (12.7%) to fair (41.2%) to good (36.3%) to very good (4.9%) to excellent (4.9%). Most patients (74.5%) believed they were in a high-risk group that would need a flu vaccine. Current flu vaccination status reflected a disparity between self-report (80.4%) and database (56.9%).

Barriers and Motivators

No barrier items scored above 35% for the non-vaccinated patients. Moderate to low barriers included fear of side effects (35%) and contracting the flu from the vaccine (30%), no provider recommendation (20%) or appointment during the flu season (20%), and egg allergy (10%).

The top motivator for vaccinated patients was having had a vaccine in the past (93%). Moderate motivators included provider recommendation (62%), convenient access in medical office (56%) and vaccines available at no cost (34%). Recommendations from friends or relatives (8%) and the media (13%), postcard reminders (9%) as well as convenient non-medical locations (2%) were low motivators.

Barriers and motivators were associated with current flu vaccination status. Moderate negative relationships were demonstrated between being afraid of getting sick (Phi –0.550, $p = 0.000$) as well as contracting the flu (Phi –0.506, $p = 0.000$) and being currently vaccinated. However, a strong relationship was found between flu vaccine history and being currently

vaccinated (Phi 0.77, p = 0.000). Moderate relationships were found between provider recommendations (Phi 0.494, p = 0.000) as well as location convenience (Phi 0.457, p = 0.000) and being currently vaccinated.

Patient Decisional Conflict

Overall, the non-vaccinated group scored higher on the total measure for decision-making conflict (M = 2.13 versus 1.50) (higher score indicates more conflict). Patient decisional conflict subscale scores differed significantly between the vaccinated and non-vaccinated patients (see Table 3). For the non-vaccinated group, certainty (M = 2.56) and feeling informed (M = 2.17) were the highest subscale scores. For the vaccinated group, certainty (M = 2.23) and feeling supported (M = 1.61) were the highest subscale scores. Differences in the mean subscale scores between the two groups ranged from 0.73 to 0.33. Overall scale reliability (alpha) for the entire sample of patients was high at 0.9291.

Patient Characteristics, Vaccination Status and Decision-making Conflict

Vaccinated (n = 82) versus non-vaccinated (n = 26) patient groups differed on patient characteristics; however, the groups were only significantly different on four patient characteristics. These characteristics were age, high-risk group classification, education, and self-report health rating. Vaccinated patients were older than non-vaccinated patients with a mean difference of 25.84 years (p < 0.000) (see Table 4). A greater percentage of vaccinated patients compared to non-vaccinated patients classified themselves in a high-risk group (85.4% versus 30.0%; p < 0.000) (see Table 4). Greater percentages of vaccinated compared to non-vaccinated patients were high school (37.8% versus 7.7%), college (11.0% versus 0%), and postgraduate (12.2% versus 7.7%) educated (p = 0.025) (see Table 5). The non-vaccinated group rated their over all health higher than the vaccinated group (p = 0.002) (see Table 6). There were no

significant differences between the two groups of patients in terms of gender, mean length of stay (LOS), ethnicity, geographic location (zip code), or admission diagnoses.

Study Limitations

Limitations of the study included that fact that while the overall sample was considered adequate, the samples for examining some associations between variables were not adequate. Therefore, it is recommended that the study be replicated using a larger sample with a stratified sampling plan.

Conclusions

Only 76.9% of the high-risk, hospitalized patients self-reported as having been vaccinated during the flu season. For a high-risk patient population, this is too few. Adding to this concern is that the organization's database only could account for 53.7% of the study patients as having been vaccinated. While more study is needed to identify why there are differences between self-reports and institutional database reports, neither percentage is acceptable for a high-risk patient population. However, to put these numbers into perspective, the percentages are higher than reported by other studies (Chan-Tack, 2001; "Missed opportunities," 1997).

While testing a theoretical model for patient decision-making was not the aim of this study, Figure 1 will be utilized to further discuss the study's findings. This theoretical model helps to organize barrier, motivator, decision-making, and demographic study variables and relate each of them to the end point, obtaining a flu vaccine. For the purpose of this discussion, individual demographic characteristics, barrier and motivator findings will be classified as either cognitive-perceptual or modifying factors. Findings from the DCS will be discussed in terms of decision-making processes.

Cognitive-perceptual Factors

Cognitive-perceptual factors include perceived high-risk classification, patient knowledge deficits, and perceived lack of provider interest. The majority of patients in the study perceived themselves to be in a high-risk group. This finding is different from other studies where the majority of patients do not perceive themselves to belong to this group (Gene, et al, 1992; Hutchinson & Norman, 1995). So, patients in this study who perceived they were in a high-risk group and who ranked their overall health as only fair to poor were vaccinated.

Like other work (Begue & Gee, 1998), fear of side effects and contracting the flu from vaccines, both based on knowledge deficits, were barriers to obtaining vaccines in this study. In other words, myths about flu vaccines are alive and well. Interestingly, media recommendations, commonly used in the fall seasons to inform the public about the need for flu vaccines was not a top motivator in this study.

Additionally, postcard reminders from providers, which might demonstrate provider interest in patient well-being, were not top motivators. Most importantly, no recommendation (perceived lack of provider interest) was associated with lower rates of vaccinations among the patients.

Modifying Factors

Modifying factors include patient demographics, behavioral factors, interpersonal relationships, and situational factors. In terms of patient demographics, older patients or those having more education were more likely to be vaccinated. More vaccinated patients also had obtained a flu vaccine in the past, an important behavioral factor. Other studies support this behavioral finding (Moran, et al., 1996; Watkins, 1997). Interestingly, interpersonal relationships with family and friends were not prominent modifying factors.

On the other hand, situational factors, such as sites conveniently located in medical offices and free vaccinations were top motivators. However, common strategies used to increase vaccination rates such as non-medical locations (including homes, shopping centers, and churches) were not top motivators.

Decision-making Processes

Patient decision-making conflict regarding obtaining vaccinations was measured in terms of certainty/uncertainty, value clarity, and presence and quality of support. Overall, non-vaccinated patients were less certain about their decision than vaccinated patients. Vaccinated patients had less conflict in terms of being certain about their decisions. The vaccinated group also felt more informed and supported. They had less conflict in terms of their values and rated the quality of their decision higher than the non-vaccinated group.

Recommendations

Busy health care professional schedules necessitate that they prioritize how they spend their time. This study demonstrated that patients with a history of flu vaccines continue to obtain the vaccines. Therefore, health care professionals need to know which patients do not have a history of flu vaccines and work with those patients. These professionals should also be targeting younger and less educated (high school and less) patients as these groups tended to be the non-vaccinated patients in this study.

Since patients perceiving themselves as high risk are obtaining flu vaccines, the key then would be to assess each patient's understanding of their status. Those who do not perceive themselves as being high risk would get some additional intervention time with the health care professional in order to bring about a different self-perception.

Some barriers and motivators are within the direct control of health care professionals and others represent system level issues. More in their direct control, health care professionals should be recommending flu vaccines because over half of the patients indicated this was a motivator. These professionals should also be discussing patient fears and myths around side effects and contracting the flu from vaccinations. These discussions may help to decrease decisional conflict and thereby increase vaccination rates.

System level issues may require more indirect and long term strategies on the part of health care professionals. For example, in staff meetings nurses and physicians should be advocating for their patients to the health care system in terms of vaccinations being conveniently located within the medical office buildings, routinely administered during appointments, and free of charge.

Overall, non-vaccinated patients were less certain about their decisions than vaccinated patients. This indicates that health care professionals have opportunities to impact the decision-making of these non-vaccinated patients. In other words, they should make an effort to continue to be proactive in providing information, dispelling myths, and removing barriers.

All health care professionals should realize that the negative myths and legends about flu vaccines are alive and well among high-risk patients. Patient perceptions are driving patient behaviors, including decisions to not obtain flu vaccinations. Health care professionals can educate their fellow coworkers to this fact and encourage everyone to discuss perceived barriers with their patients to clarify misconceptions.

Given the potential negative consequences of contracting the flu, prevention is the best strategy. Prevention is contingent upon motivating patients to obtain an annual flu vaccine. The findings from this study highlight the important role health care professionals have in medical

offices and acute care settings as the front line “motivator” when it comes to promoting flu vaccinations among high-risk patients during the flu season. Patients follow the recommendations of their providers to obtain flu vaccines.

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Table 1 Motivators and Barriers

Motivators	Barriers
Past personal practice of obtaining vaccine annually Provider recommendation Media recommendation Relative or friend recommendation Post card reminder Close contact with others with flu Convenient location No charge for vaccine	Fear of needles Fear of contracting flu Fear of becoming ill from vaccine No recommendations to obtain the vaccine Unable to obtain the vaccine Unable to get to a vaccination location Inconvenient location No appointment with provider during flu season Cost Too ill Pregnant & thought could not receive vaccine Allergy to eggs

Table 2 Respondents' Characteristics (N=108)

Characteristic	Mean (SD)	Range	% (*n*)
Age (in years)	66.3 (22.17)	2-95	
Gender			
Male			50.9 (55)
Female			49.1 (53)
Ethnicity			
Caucasian			89.6 (86)
Hispanic			11.8 (7)
Asian/ Pacific Islander			11.8 (2)
Black/ African American			1.0 (1)
Highest Level of Education			
Less than high school			11.7 (11)
High school graduate			31.5 (33)
Some college			30.9 (29)
College graduate			11.8 (9)
Post graduate			12.8 (12)
Self-rated Health			
Poor			12.7 (13)
Fair			41.2 (42)
Good			36.3 (37)
Very good			11.8 (5)
Excellent			4.9 (5)
High risk group needing vaccine			
Yes			74.5 (76)
No			13.7 (14)
Not sure			11.8 (12)
Self-report vaccination status			
Vaccinated			75.9% (82)
Not vaccinated			24.1% (26)

Table 3 Patient Decision-making Conflict (N=108)

Sub Scales	Vaccinated Mean Score (SD)	Non-Vaccinated Mean Score (SD)	t-test
Certainty	2.23 (0.66)	2.56 (0.58)	-1.996* df 93
Feeling Informed	1.51 (0.60)	2.17 (1.01)	-2.752* df 91
Clear Values	1.47 (0.57)	2.11 (0.86)	-3.022** df 90
Feeling Supported	1.61 (0.63)	2.06 (0.81)	-2.545* df 89
Quality of Decision	1.46 (0.64)	2.13 (0.80)	-2.968** df 88
Total Scale	1.50 (0.54)	2.13 (0.80)	-3.219** df 92

*p< 0.05 **p<0.01 Overall scale reliability (alpha) = 0.9291

Table 4 Vaccinated versus Non-vaccinated group comparisons by patient characteristics (age, gender, perceived high risk group classification, mean LOS) (N=108)

Patient Characteristic	Vaccinated	Non-Vaccinated	Test Value	Sig[2]
Age Group	Mean rank 56.57	Mean rank 30.73	Man Whitney U 404.5	0.000
Gender	M 48.8% (40) F 51.2% (42)	M 65.0% (13) F 35.0% (7)	X^2 1.695 df 1	0.193
Perceived High Risk Group Classification	Yes 85.4% (70) No 6.1% (5) Not sure 8.5% (7)	Yes 30.0% (6) No 45.0% (9) Not sure 25.0% (5)	Cramer's V 0.525	0.000
Mean LOS[1]	6.10 Days	5.30 Days	t-test 0.739 df 100	0.462

[1] Length of stay
[2] Level of Significant (p value)

Table 5 Vaccinated versus Non-vaccinated group comparisons to education (N=108)

	< High School % (n)	High School % (n)	Some college % (n)	College % (n)	Post graduate % (n)	No response % (n)
Vaccinated (n=82)	9.8% (8)	37.8% (31)	23.2% (19)	11.0% (9)	12.2% (10)	6.1% (5)
Non-vaccinated (n=26)	11.5% (3)	7.7% (2)	38.5% (10)	0% (0)	7.7% (2)	34.6% (9)

Cramer's V 0.344; p = 0.025

Table 6 Vaccinated versus Non-vaccinated group comparisons to self-reported health rating (N=108)

	Excellent % (n)	Very Good % (n)	Good % (n)	Fair % (n)	Poor % (n)	No response % (n)
Vaccinated (n=82)	1.2% (1)	3.7% (3)	35.4% (29)	43.9% (36)	15.9% (13)	0% (0)
Non-vaccinated (n=26)	15.4% (4)	7.7% (2)	30.8% (8)	23.1% (6)	0% (0)	23.1% (6)

Cramer's V 0.407; p = 0.002

Figure Caption

Figure 1. Theoretical decision-making model for obtaining a flu vaccination based upon available literature.