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Understanding Caregiver Factors Influencing Childhood Influenza Vaccination

Gianelle M. Avola and Jennifer A. Lyon

Nursing Honors in Major

University of New Hampshire

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CAREGIVER FACTORS INFLUENCING INFLUENZA VACCINATION

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Abstract

Influenza is a viral disease that affects approximately 30% to 40% of American children yearly. It is recommended that all children 18 and under be vaccinated. The literature shows that caregivers have identified many barriers to vaccination. This current study adds to the existing body of nursing knowledge by identifying the barriers to vaccination in the local population. This study replicated an existing survey instrument to collect data from a convenience sample of subjects. Subjects were accrued through snowball sampling via social media and in person. A total of 119 surveys were returned. The knowledge generated from the survey may be used to formulate education programs to increase vaccination rates.

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Understanding Caregiver Factors Influencing Childhood Influenza Vaccination

Influenza is a vaccine preventable viral disease that afflicts approximately 30% to 40% of American children each year (Hemingway & Poehling, 2004). The United States Centers for Disease Control (CDC) currently recommends that all healthy and high risk children, ages six months to 18 years, be vaccinated annually against influenza. However, vaccination rates are nowhere near 100%. In a report comparing the 2008-09 flu season to the 2009-10 flu season, vaccination coverage at eight sentinel sites of documentation changed little for children ages six to 23 months. There was approximately a 5% increase in vaccination in the age groups of two to four years and 15 to 18 years, resulting in rates of 38.4% and 15.3%, respectively. Children ages five to 12 years experienced the largest increase, from 19% to 27.1% (Centers for Disease Control [CDC], 2010). These increases are likely related to the outbreak of H1N1 influenza.

Previous quantitative studies have found there are many perceived barriers by parents in vaccinating their children against influenza. Chen et al. (2011) found that the children most likely to be vaccinated were those who had chronic illnesses or a history of hospitalization or influenza. A common finding in the literature is that access to vaccines is a barrier to vaccinations (Flood et al., 2010; Hemingway & Poehling, 2004). The findings in Hemingway and Poehling's study (2004) also found that lack of knowledge, concern about side effects, and lack of recommendation by healthcare providers are additional barriers to vaccination. Misperceptions, such as believing the vaccination can cause an influenza infection or that the disease is not very common, are barriers that are consistent with the Health Belief Model (American Psychological Association [APA], 2007). However, there was no evidence available confirming these barriers specific to this local population.

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Purpose

The purpose of this study was to gain an understanding about factors that influence caregivers in making the decision whether or not to vaccinate their children against influenza.

Significance

Nursing. Approximately 20,000 children are hospitalized each year for influenza and related complications. Dozens of these children die from their illness (Flood et al., 2010). The treatment and care of these children require many skilled nursing hours and large amounts of money during their stays. However, influenza is a vaccine preventable disease, meaning nearly all of these medical costs could be avoided. Therefore, a deeper understanding of what prevents parents from vaccinating is necessary for the discipline of nursing in order to develop programs and patient education that will increase vaccination coverage.

Patients. Such research is helpful to patients, because, with more knowledge on what prevents vaccination, nurses can target education to specific barriers. By targeting education to the needs of a specific family, the children in that family may end up vaccinated. Also, by understanding common barriers, nurses can develop programs to increase vaccination coverage in the pediatric population. Increased vaccination rates would decrease the incidence of influenza. While vaccination does not always prevent the disease, it often lessens the symptoms. A global outcome of increased vaccination could be a decreased incidence and severity likely to lead to fewer related hospitalizations and complications.

Theoretical/Conceptual Framework and Rationale

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This study was guided by the Health Belief Model (Chen et al., 2011). The Health Belief Model is a framework that is often used in the study of parental decision-making regarding health related behavior. The Health Belief Model follows the assumption that people will perform disease preventing behaviors if four key components are present. These components are that the people believe they are susceptible to the disease; they believe the disease is serious; they believe the disease preventing behaviors have few barriers; and they are prompted to engage in the behaviors (Chen et al., 2011). Therefore, if a parent believes the child is susceptible to influenza, that influenza is a serious disease, and that there are few barriers to vaccination, than the parent will have their child vaccinated when prompted.

Review of the Literature

There is limited available research in the nursing literature. The majority of the literature is from the allied health professions.

Experience of Influenza

To truly understand the importance of influenza vaccinations, it is necessary to look at the experiences of children who acquire the disease. In a qualitative study, 28 children ages six to 12 years old were asked about their experiences with influenza and thoughts about vaccination (Flood et al., 2011). One quarter responded that they had the flu in the past, while others described symptoms based off observations of family and friends. They described symptoms such as fatigue, malaise, headache, fever, muscle aches, stomachaches, and vomiting. All could comment on being ill in general. Their responses indicated that they disliked being sick for such reasons as missing time with friends and family, not feeling well, and missing school. The children, 79% of whom had previously been immunized against influenza, were able to understand the benefits of vaccination, and stated reasons for getting the vaccine were to prevent disease,

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lower risk of contracting or spreading disease, prevent missed school and time with family and friends, and reduce costs of medication. When given an option between an injection and a nasal spray, most children picked efficacy in the form of the injection over their preferred, painless method of vaccination (Flood et al., 2011).

There is an estimate present in the literature that 7 out of every 10,000 pediatric admissions are due to influenza. A four year study looking at 745 children younger than 21 years with laboratory-confirmed influenza examined complications both related to influenza and to hospitalization. Approximately 49% of the children had a chronic illness, meaning at least half of the children hospitalized were otherwise healthy. Complications seen in the subjects studied were suspected bacterial pneumonia (15%), seizure (7%), respiratory failure (4%), myositis (2%), encephalopathy (1%), and bacteremia (1%). Five of the children died (Coffin et al., 2007). However, influenza is a vaccine preventable disease.

Efficacy of Vaccine

There are two types of influenza vaccines, the trivalent influenza vaccine (TIV) and the live, attenuated influenza vaccine (LAIV). The TIV is the traditional flu shot, and is approved for those above six months of age. The LAIV is a nasal spray for those two years and older (Monto et al., 2009). In a study examining the efficacy of the TIV in children ages six months to five years, subjects were placed into one of three categories: fully vaccinated, meaning the child had received both doses of the vaccine, partially vaccinated, in that the child had only received one vaccine, and unvaccinated. All cases of influenza were laboratory-confirmed. In the 2003-2004 season, there were 228 confirmed cases of influenza out of 1,033 subjects. Of these, 3.5% were in fully vaccinated children, 9.7% were in partially vaccinated children, and 86.8% were in unvaccinated children. In the 2004-2005 season, 197 children out of a total 1,502 subjects contracted influenza. The percentages for fully, partially, and unvaccinated children were 12.2%, 21.8%,

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and 66%, respectively. The efficacy of the vaccine in the 2005-2006 season was 57%, which was statistically significant (Eisenberg et al., 2008).

A more recent study compared the TIV and LAIV. This was a double-blind, placebo-controlled randomized control trial including healthy men and women ages 18 to 49 years. Of these, 814 received the TIV, 813 received the LAIV, and 325 received a placebo, either an injection or nasal spray. During that flu season 6.1% were diagnosed with laboratory-confirmed influenza. After statistical analysis, it was shown that the TIV had an absolute efficacy of 73%, compared to 51% in the LAIV. This translates into an approximately 50% increase in effectiveness in the TIV (Monto et al., 2009). However, this study was performed on adults, and further research needs to be done on efficacy in children.

Parental Perceptions of Influenza and Vaccination

Many of the studies regarding vaccination are based on the Health Belief Model (Chen et al., 2011; Gnanasekaran et al., 2008; Flood et al., 2010), which uses several factors to predict the likelihood of healthy behaviors. One such study in Taiwan looked at survey responses of 2,778 parents and caregivers of children six months to three years (Chen et al., 2011). Study results were mostly congruent with the theory, with a positive correlation between vaccination and perceived susceptibility, perceived benefits, and cues to action and a negative correlation with vaccination and perceived barriers. However, no correlation was noted between vaccination and perceived severity of influenza. Statistically significant determinants of vaccination were safety of vaccines, perception that the child gets ill easier than other children, and negative media attention surrounding influenza vaccination. Doctors' and nurses' recommendations were not statistically significant drivers to vaccinate. This study also found that parents were more likely to vaccinate if the child had a history of chronic illness, influenza, or hospitalization (Chen et al., 2011).

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Another study of parents of children ages two to 12 years identified many beliefs about influenza. Statistically significant ones were that influenza is not a serious disease in healthy children, the immunization is safe and effective at preventing or lessening symptoms of the flu, and, alternatively, that the vaccine may result in influenza infection or a chronic illness. Prevention of illness and its spread and reduction of symptoms were among the top drivers, as well as a physician recommendation. Convenience was among the lowest drivers. The most common barriers listed were the perceptions that the child is not very susceptible to influenza, the vaccine can cause the flu and other side effects, and that influenza is not a severe illness. Uncommon barriers were a bad past experience with the vaccine for either the parent or child. No drivers or barriers included in survey involved nurses (Flood et al., 2010). A third report found that parents with younger children were more likely to vaccinate (Gnanasekaran et al., 2008).

Findings were similar in a two-part survey completed by 316 parents of children six to 21 months old both before the influenza season and after (Daley et al., 2006). Of the 18% of parents who did not vaccinate, the barriers cited were inadequate vaccine stores, illness in the child, inadequate knowledge or education, difficulties making an appointment, and cost of the vaccine. Parental attitudes toward vaccination also acted as barriers, such as a low perceived benefit, susceptibility, and severity (Daley et al., 2006).

The most important factors contributing to vaccination rates appear to be physician recommendation and reminders. Nowalk et al. (2007) found that parents' and doctors' opinions on vaccination were statistically significant in determining if the child was vaccinated. Another key facilitator to vaccination was receiving a written reminder from the provider to vaccinate (Nowalk et al., 2007). In another survey, statistically significant determinants of vaccination were accessibility of the doctor's office, knowledge of recommendations, opinions of family, and friends, and the perception that an unvaccinated child is susceptible to influenza. The primary determinant, again, was the physician recommendation (Lin et

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al., 2006). However, 55% of the parents in a third survey reported that they had not received a reminder from their physician to vaccinate (Gnanasekaran et al., 2008).

Methodology

Research Question and Study Design

The research question for this study was “What factors are associated with a caregiver’s choice not to vaccinate their children against influenza?”.

Definition of Terms

These terms are being defined in order to clarify their meaning and ensure understanding of their use throughout this manuscript.

A *barrier* is defined as any factor that dissuades a parent from vaccinating his or her child against influenza.

A *caregiver* is defined as any parent or legal guardian who is responsible for making healthcare decisions for his or her child.

Opposite of the barrier, a *driver* is defined as a factor that encourages the parent to vaccinate.

The word *flu* may be used interchangeably with influenza. Influenza is a contagious disease characterized by such symptoms as fever, chills, nausea, vomiting, nasal congestion, and coughing, among others.

The terms *vaccination* and *immunization* may be used interchangeably. These are defined as weakened or inactive viruses that are administered to a person in order to build immunity and prevent disease. Unless otherwise specified, the terms will refer to both the live attenuated

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influenza vaccine (LAIV), which is given by nasal spray, and the trivalent influenza vaccine (TIV), which is administered via injection.

Setting, Subjects, and Sampling

This study was conducted virtually through social media as well as in person at several different sites in the New England region.

Subjects were eligible for inclusion in this if they could read and speak English fluently, in order to decrease the risk of misinterpretations. The subject had to be the parent or legal guardian who primarily makes the healthcare decisions for the child. The caregiver must have had at least one child in the specified age range: six months to twelve years old. Six months is the minimum age because seasonal flu vaccines are not offered for children younger than this. Twelve years is the maximum age because as children age, they become partners in making health-care decisions (Kuther, 2003). There were no restrictions on inclusion based on race, ethnicity, religion, marital status, socioeconomic status, education, or citizenship. Subjects were accrued using snowball sampling and recruitment by the researchers.

Instruments

The instrument used in this study was a three part questionnaire developed by Chen et al (2011), and adapted with permission. The first part was the Caregiver Demographics Questionnaire. The second part was the Children's Health History Questionnaire, which collected information about the influenza vaccination history of the child, as well as history of chronic diseases and hospitalization. The third section of the survey was based on the Health Belief Model. Five subsets were included in the 15-item scale, which included: perceived susceptibility (two items), perceived severity (three items), perceived benefits (three items), perceived barriers (four items), and cues to action (three items).

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Procedures

Approval was obtained from the University of New Hampshire Institutional Review Board prior to data collection. An introductory letter detailing the purpose, expected benefits, absence of risk to the subject, and insurance of confidentiality prefaced each survey. Consent for participation was implied with the completion of the survey. For the Child Health History Questionnaire, caregivers were asked to answer the questions as they were appropriate to their youngest child in the age range. The perceptions and beliefs section included statements that respondents were to indicate either their agreement or disagreement with.

Data Analysis

Descriptive statistics were used to analyze the demographic and child health history data. Between-group analysis was initially used to identify trends in data from the section on beliefs and perceptions. Chi-squared analysis was done to test for significance in the resulting data. The confidence interval was set at $p \leq 0.05$.

Findings

Caregiver Demographics and Child Health History

The majority of caregivers, 71%, were above the age of 30 years. Caregivers were evenly split between employed and unemployed. The vast majority of subjects identified themselves as white, non-Hispanic. Approximately 42% of subjects had only a senior high school or equivalent level of education. Most respondents were mothers who were married and living in a suburban residence. The majority of participants had an annual household income of greater than \$100,000; however, the second most popular response for this section was an annual household income of less than \$25,000. For more detailed demographic data, see Appendix A.

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Data from the Child Health History Questionnaire indicated that 66% of caregivers vaccinated their child against influenza in the flu season prior to the completion of the survey. In regards to the children's medical histories, 70% had contracted the flu in the past, 74% had no history of chronic illness, and 76% had never been hospitalized. Only three respondents indicated that their child is not covered by a health insurance policy.

Perceived Barriers to Vaccination

The significant findings in this study were all related to the barriers to vaccination. Through analysis of the data, it was shown that caregivers who believe their children are not at risk for influenza are less likely to vaccinate. This study also found that caregivers who believe vaccines weaken the natural immune system or have unpleasant side effects were less likely to vaccinate. In addition, beliefs that the immunization is not safe or effective were barriers to vaccination. Interestingly, data analysis also revealed that one of the most significant barriers to vaccination was a positive history of influenza in the child.

Other clinically significant, but not statistically significant, barriers to vaccination were general opposition to vaccinations and the influence of negative news. The majority of caregivers who did not vaccinate had an understanding that influenza can cause serious complication and is a contagious disease that could spread to other members of the family. The majority of respondents who did not immunize also acknowledged that they believe the vaccine to be safe. However, very few ($n < 5$) of the 38 respondents who did not vaccinate believe their children are at high risk for influenza.

Interesting Findings

The following results did not reach the level of statistical significance however, in the studied population, caregivers younger than 30 years of age were less likely to vaccinate. Of those who did not vaccinate, 54% were employed. The table found in Appendix B demonstrates the education level and

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sources of influence of those caregivers that did not vaccinate. Caregivers with a lower education level are less likely to be influenced by media or healthcare provider recommendations. In this study, influence of the media is understood to be media recommendations, not negative news. It is unknown who, if anyone, is influencing these decisions.

Discussion

The findings of this study are consistent with the Health Belief Model, especially in that caregivers understand their children's susceptibility to influenza and the potential seriousness of the disease. In this study, susceptibility was measured by the caregiver's decision not to have the child vaccinated if they had a history of influenza. The majority caregivers who did not vaccinate identified influenza is a serious and potentially dangerous illness. The extent of the influence of the factors remains unknown.

Comparison to Original Study

The original study that developed the survey tool used in this study was by Chen and associates (2011) in Taiwan with an *n* of 2,778 respondents. There were several differences in their findings compared to those found in this study. Chen (2011) found that caregivers younger than 30 years old were more likely to vaccinate, while they were less likely to vaccinate in this population. The Taiwanese study found that caregivers who live in a rural setting were more likely to vaccinate (Chen et al, 2011). In this study, only 22% of those that did not vaccinate lived in a rural setting.

These studies also yielded some similar results. The original study found that a history of hospitalization in the childhood increased the likelihood that the caregiver would choose to vaccinate (Chen et al, 2011). Both studies came to the same conclusion that employed caregivers are less likely to vaccinate. Chen (2011) also found that if the child had a history of influenza, the caregiver was more likely to choose vaccination. In this study, 63.6% of children with a history of influenza were vaccinated. However, a history

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of influenza was one of the biggest barriers to vaccination in the caregivers that chose not to immunize.

Lastly, Chen (2011) also found that doctors' and nurses' recommendations were not significant drivers to vaccinate.

Implications for Nursing

The findings that resulted from this quantitative study will advance nursing practice by allowing nurses to provide better patient education in regards to vaccination. It will allow nurses to develop widespread vaccination promotion programs that target the most common barriers to vaccination. Other findings may reveal additional steps nurses can take to increase vaccination coverage. This study will also encourage nurses to discuss vaccination with parents and specifically target perceived barriers.

Recommendations

The recommendations of the researchers aim to increase the influence of healthcare providers on the decision to vaccinate. The data revealed in this study discovered that healthcare provider recommendations were not significant factors in caregivers' decision-making. Healthcare providers must seek to find ways to provide education to caregivers on influenza as a disease and the actual risks and benefits associated with vaccination in order to encourage them to vaccinate. Those with a low level of education and did not vaccinate were found to be less influenced by health care providers and the media compared to those of a higher education level. Therefore, educational programs should be aimed at this population. Education can occur through postings at child care facilities and in person at the doctor's office.

It is also the suggestion of the researchers that further research is needed on caregivers' beliefs about the convenience of vaccination and vaccine availability. These are potential

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barriers that were not included on the survey tool used in this study. However, with caregivers who did not vaccinate reporting an understanding that influenza is a potentially dangerous illness and vaccinations are safe, it raises the question if they choose not to vaccinate due to issues of convenience.

Limitations

Limitations of this study include a small sample, n=119, for a survey tool and a homogenous sample due to sampling methods. Additionally, the original survey tool should be modified to include a Likert scale with the belief statements would have allowed the degree of influence of the factors to be measured.

Conclusion

Influenza is a contagious, vaccine-preventable disease. In findings consistent with the Health Belief Model, caregivers in the local populations have identified low risk of disease and side effects of immunizations as being common barriers to vaccination. Some of the barriers found in this study were mirrored in the original study the provided the survey tool. Nurses can help increase vaccination rates among children by educating caregivers in one-on-one interactions and creating educational programs about influenza and immunization.

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References

- American Psychological Association. (2007). Misperceptions about influenza vaccination among parents of healthy young children. *Clinical Pediatrics*, 46(5), 408-417. Retrieved from <http://cpj.sagepub.com/>
- Centers for Disease Control. (2010). Seasonal influenza vaccination coverage among children aged 6 months- 18 years- eight immunization information system sentinel sites, United States, 2009-10 influenza season. *MMWR: Morbidity & Mortality Weekly Report*, 59(39), 1266-1269. Retrieved from http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5939a2.htm?s_cid=mm5939a2_w
- Chen, M., Wang, R., Schneider, J. K., Tsai, C., Jiang, D. D., Hung, M., & Lin, L. (2011). Using the health belief model to understand caregiver factors influencing childhood influenza vaccinations. *Journal of Community Health Nursing*, 28(1), 29-40. Doi: 10.1080/07370016.2011.539087
- Daley, M., Crane, L., Chandramouli, V., Beaty, B., Barrow, J. Allred, N., . . . Kampe, A. (2006). Influenza among healthy young children: changes in parental attitudes and predictors of immunization during the 2003 and 2004 influenza season. *Pediatrics* 117(2), e268-277. Retrieved from <http://pediatrics.aappublications.org/>
- Eisenberg, K., Szilagyi, P., Fairbrother, G., Griffin, R., Staat, M., Shone, L., . . . Iwane, M. (2008). Vaccine effectiveness against laboratory-confirmed influenza in children 6 to 59 months of age during the 2003-2004 and 2004-2005 influenza seasons. *Pediatrics*, 122(5), 911-919. Retrieved from <http://pediatrics.aappublications.org/>

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Flood, E., Block, S., Hall, M., Rousculp, M., Divino, V., Toback, S. & Mahadevia, P. (2011). Children's perceptions of influenza illness and preferences for influenza vaccine. *Journal of Perdiatric Healthcare*, 25(3), 171-179. Doi: 10.1016/j.pedhc.2010.04.007

Flood, E., Rousculp, M., Ryan, K., Beusterian, K., Divino, V., Toback, S., ... Mahadevia, P. (2010). Parents' decision-making regarding vaccinating their children against influenza: A web-based survey. *Clinical Therapeutics*, 32(8), 1448-1467. Doi: 10.1016/j.clinthera.2010.06.020

Gnanasekaran, S., Finkelstein, J., Hohman, K., O'Brien, M., Kruskal, B. & Lieu, T. (2006). Parental perspectives on influenza vaccination of children with asthma. *Public Health Reports*, 121(2), 181-188. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1525270/pdf/phr121000181.pdf>

Hemingway, C., & Poehling, K. (2004). Change in recommendation affects influenza vaccinations among children 6 to 59 months of age. *Pediatrics*, 114 (4 Part 1), 948-952. Retrieved from <http://pediatrics.aappublications.org/content/114/4/948.full>

Kuther, T. (2003). Medical decision-making and minors: issues of consent and assent. *Adolescence*, 38(150), 343-358. Retrieved from <http://www.journals.elsevier.com/journal-of-adolescence/>.

Lin, C., Zimmerman, R., Nowalk, M., Ko, F., Raymund, M., Hoberman, A., Kearney, D. & Block, B. (2006). Parental perspectives on influenza vaccination of children with chronic medical conditions. *Journal of the National Medical Association*, 98(2), 148-153. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2595047/>

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Monto, A., Ohmit, S., Petrie, J., Johnson, E., Truscon, R., Teich, E., . . . Victor, J. (2009). Comparative efficacy of inactivated and live attenuated influenza vaccines. *New England Journal of Medicine*, *361*(13), 1260-1267. Doi: 10.1056/NEJMoa0808652

Nowalk, M., Lin, C., Zimmerman, R., Ko, F., Hoberman, A., Zoffel, L. & Kearney, D. (2007). Changes in parents' perceptions of infant influenza vaccination over two years. *Journal of the National Medical Association*, *99*(6), 636-641. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2574366/pdf/jnma00205-0042.pdf>

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Appendix A
Demographics Table

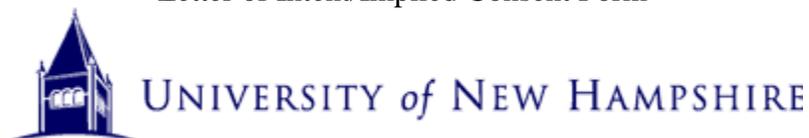
	%	Number
Age		
Less than or equal to 30	29.4	35
Greater than 30	70.8	84
Total Responses		119
Caregiver Role		
Father	8.4	10
Mother	87.4	104
Grandparent	3.4	4
Aunt or Uncle	0	0
Other	0.8	1
Total Responses		119
Marital Status		
Unmarried	19.3	23
Married	66.4	79
Divorced	12.6	15
Widowed	1.7	2
Total Responses		119
Description of Residence		
Urban	11.6	13
Suburban	64.3	72
Rural	24.1	27
Total Responses		112
Estimated Annual Income		
\$25,000 or less	34.5	40
\$25,000-\$75,000	37.7	33
\$100,000 or greater	28.4	33
Total Responses		116
Insurance Covers Child		
Yes	97.5	115
No	2.5	3
Total Responses		118
Race		
White, non-Hispanic	89.9	107
Black	1.7	2
Hispanic or Latino	1.7	2
Asian	1.7	2
American Indian or Alaska Native	0.8	1
Two or more races	4.2	5
Total Responses		119
Employment Status		
Employed	50	59
Unemployed	50	59
Total Responses		118
Education Level		
Elementary or Junior High	1.7	2
High School or Equivalent	41.5	49
Associates Degree	17.8	21
Bachelor's Degree or higher	39.0	46
Total Responses		118

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Appendix B
Education Level and Source of Influence in Those Who Do Not Vaccinate

	≥ Bachelor's Degree	Associates Degree	High School Degree
Media	33.3%	0%	21%
Nurse	50%	40%	20%
Physician	58.3%	40%	30%

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Appendix C
Letter of Intent/Implied Consent Form

Dear Parent, Legal Guardian, or Caregiver:

We are conducting a research project to identify that factors that influence the decision making process of a parent, legal guardian, or care taker related to choosing to vaccinate their child/children against influenza or not. We are writing to invite you to participate in this project. We plan to work with a target number of 100 subjects in this study. If you agree to participate in this study, you will be asked to confidentially complete and submit a survey consisting of multiple choice and yes/no questions that will take approximately 5 minutes to complete. You will not receive any compensation to participate in this project.

There are no expected potential risks associated with participating in this study. Although you are not anticipated to receive any direct benefits from participating in this study the benefits of the knowledge gained are expected to be useful in identifying factors that can increase the influenza immunization rate within the population. Participation is strictly voluntary; refusal to participate will involve no prejudice, penalty, or loss of benefits to which you would otherwise be entitled. If you agree to participate and then change your mind, you may discontinue with the survey at any time.

We seek to maintain the confidentiality of all data and records associated with your participation in this research. If you are participating in this study online, you should understand that any form of communication over the Internet does carry a minimal risk of loss of confidentiality. This is an anonymous survey and there is no personally identifiable information attached to the data collected. We will report the data in aggregate. The results will be used in reports, presentations, and publications.

The work will be conducted by us and Pamela DiNapoli, RN, PhD, an associate professor within the nursing department at UNH. We are undergraduate honors students within the nursing department at UNH.

If you have any questions about this research project or would like more information before, during, or after the study, you may contact Jennifer Lyon at jaz72@unh.edu and 802-598-8348, or Gianelle Avola at gmr27@unh.edu and 603- 494-2890. If you have questions about your rights as a research subject, you may contact Dr. Julie Simpson in UNH Research Integrity Services at 603-862-2003 or Julie.simpson@unh.edu to discuss them.

The completion of this survey is considered to be your consent to participate in this study.

Sincerely,

Jennifer Lyon and Gianelle Avola

University of New Hampshire Undergraduate Nursing Students

CAREGIVER FACTORS INFLUENCING INFLUENZA VACCINATION

Appendix D
Caregiver Demographics and Children's Health History Questionnaire**Caregiver**

1. Age-
 - a. less than or equal to 30
 - b. >30
2. Role-
 - a. Father
 - b. Mother
 - c. Grandparent
 - d. Aunt or Uncle
 - e. Other (e.g. babysitter)
3. Marital Status-
 - a. Unmarried
 - b. Married
 - c. Divorced
 - d. Widowed
4. Education Level-
 - a. No formal education
 - b. Elementary or Junior high school
 - c. Senior high school
 - d. Associates degree
 - e. Bachelor's degree or higher
5. Current Employment-
 - a. No
 - b. Yes
 - c. Retired
6. Race-
 - a. White, non-Hispanic
 - b. Black
 - c. Hispanic or Latino
 - d. Asian
 - e. Native Hawaiian and Other Pacific Islander
 - f. American Indian and Alaska Native Persons
 - g. Persons reporting two or more races
7. Residence-
 - a. Urban
 - b. Suburban

CAREGIVER FACTORS INFLUENCING INFLUENZA VACCINATION

- c. Rural
- 8. Insurance Coverage-
 - a. Yes
 - b. No
- 9. Estimated Annual Income of Family-
 - a. \$25,000 or less
 - b. \$25,000 to \$50,000
 - c. \$50,000 to \$75,000
 - d. \$75,000 to \$100,000
 - e. \$100,000 or more

Children

- 1. Chronic illness history-
 - a. None
 - b. Asthma
 - c. Skin or nasal allergy
 - d. Congenital heart disease
 - e. Two or more chronic diseases
- 2. Hospitalization History-
 - a. No
 - b. Yes
- 3. Influenza History-
 - a. No
 - b. Yes
 - c. Unknown

CAREGIVER FACTORS INFLUENCING INFLUENZA VACCINATION

Appendix E
Health Belief Model Questionnaire Items

1. Perceived Susceptibility-
 - a. My children have a high risk of influenza.
 - b. My children get sick more easily than other children do
2. Perceived Severity-
 - a. Influenza infection may cause serious health problems.
 - b. Influenza with complications is dangerous.
 - c. If any of my children contracted influenza, the disease could spread to other family members.
3. Perceived Benefits-
 - a. Influenza vaccinations can relieve influenza symptoms and complications.
 - b. Influenza vaccinations effectively protect against the flu.
 - c. Influenza vaccines are safe for children.
4. Perceived Barriers-
 - a. I am generally opposed to vaccinations.
 - b. Influenza vaccinations have unpleasant side effects.
 - c. Influenza vaccinations weaken the natural immune system.
 - d. I am influenced by negative news about influenza vaccines.
5. Cues to Action-
 - a. The recommendation in the mass media affects my decision whether to vaccinate my children for influenza.
 - b. My doctor(s) recommendation affects my decision whether to vaccinate my children for influenza.
 - c. My nurse(s) recommendation affects my decision whether to vaccinate my children for influenza.