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## Flu Vaccination Acceptance among Children and Awareness of Mothers in Japan

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### Abstract

**Background:** In Japan, a number of people who die from influenza are still increasing however seasonal influenza immunization rates among children are still low and estimated to be around 30%. Given these circumstance we organized questionnaire surveys from 2009 to 2010 to examine the factors influencing awareness of mothers under frame work of Health Belief Model (HBM) that affect seasonal flu immunization acceptance among children. **Method:** From 2009 to 2010, we sent questionnaires to randomly selected university graduated women. The questionnaire asked their age, seasonal flu immunization status of their children, working status, subjective life standards, regions where they live, perceived severity of flu to their children, perceived susceptibility to flu of their children, perceived efficacy or non-efficacy of flu vaccination on their children, barriers to vaccination such that flu vaccination is non-mandatory, fear for side effect, busy and others, cues to the action such as family doctors recommendations and willing to pay (WTP). After the correlation of each variable was tested by spearman test (SPSS 17.0) adjusted logistic regression analysis predicting routine vaccination was done. **Results:** we sent 554 questionnaires to women and 226 mothers (Age 44.67±5.09) responded and 220 responses were analyzed. Among children of respondents, 41.2 % were routinely flu shot vaccinated. From the multivariate logistic regression model, HBM framework showed that perceived susceptibility to flu of their children's (aOR=1.46, p>0.05), perceived severity of flu (aOR=1.14, p>0.05) to their children, perceived non-efficacy of flu vaccination on their children (aOR=0.12, p<0.01), and cue to the action such as family doctors' recommendations (aOR=2.47, p<0.01) and knowing of the flu vaccination subsidy (aOR=1.96, p>0.05) were positive factors for flu immunization acceptance. On contrary, barriers such as subjective lower life standard (aOR=0.59, p<0.05), flu-shot was not mandatory (aOR=0.15, p<0.01), fear from side effects (aOR=0.31, p<0.05) and number of children (aOR=0.64, p<0.05) were negative factors. **Discussion;** Correct education and knowledge dissemination for mothers are necessary to raise the low coverage rate of their children in order to prepare potential future flu pandemic.

**Keywords:** vaccine acceptance, Health Belief Model, flu vaccination in Japan

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*Keywords:* Influenza vaccination, mother's awareness to childrens' vaccination, Health Belief Model

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## 1. Background and Objectives

In Japan, the number of people dying from influenza is still increasing, however, the seasonal influenza immunization rates especially among children are low and estimated to be approximately 30%. Considering future flu outbreaks, this low vaccination rate is one of public health concerns. The Health Belief Model (HBM), which was initially developed in the 1950s, has been one of the most widely used conceptual frameworks in health behaviour including immunization (2-4). Also, parents', especially mothers' awareness to vaccination about their children influences their children's vaccination uptake (6-9). However, these kinds of studies are rare here in Japan. Under these circumstances, focusing on HBM factors as well as mothers' awareness, we organized a questionnaire survey from 2009 to 2011 to examine the factors influencing maternal awareness that affect seasonal flu immunization acceptance among children in this study. Health Belief Model constructs such as perceived susceptibility to flu of their children, perceived severity of flu to their children, perceived efficacy of flu vaccination on their children, perceived barriers, willing to pay (WTP), cues to the action for flu immunization of their children were included in the questionnaire.

## 2. Subjects and Method

From 2009 to 2011, we sent 1268 questionnaires by postal mails to randomly selected female University graduates using graduate books of Waseda University and other equivalent universities. Six hundred twenty eight questionnaires were returned because of moving out or other reasons. Two hundred twenty-six mothers who children had responded to these questionnaires. The questionnaire asked their age, seasonal flu immunization status of their children (every year, sometimes, never), mothers' working status (yes, no), subjective life standards (very good, good, average, poor and very poor), regions where they live (urban, rural-adjacent, rural), and HBM constructs about mothers such as perceived susceptibility to flu of their children (Do you think your children susceptible to flu?), perceived severity of flu to their children (Do you know how severe if your child got flu?), perceived non-efficacy of flu vaccination on their children (Do you think flu shot is not effective for your children?), WTP (willing to pay; How much can you pay for flu vaccination for your children?), barriers to vaccination such that flu vaccination is non-mandatory, fear from side effects, busy and others, cues to the action such as family doctors recommendations, knowing subsidy to flu shot or not. After univariate correlation was tested by Spearman test, multivariate adjusted logistic regression analysis was performed predicting routine vaccination as a dependent variable focusing on HBM constructs. Analysis was done for about 220 first order children in order to avoid selection biases (SPSS 17.0). In questionnaires it was clearly noted that informed consents to participate this survey will be regarded to obtain by responding and returning the questionnaires. Additional IRB review was not undertaken.

## 3. Results

We received 226 responses from mothers. Insufficient responses were excluded and 220 returned valid questionnaires were used for analyze in this study. Participant mothers and children's characteristics are shown in Table 1. Among the children of the respondents, 41.2% were routinely vaccinated against the flu in this group, which was a little higher than flu vaccination rate of around 30% in general public. The result of univariate analysis is shown in Table 2. From this result, extracting significant variables and HBM constructs, a multivariate logistic regression model was constructed. From the multivariate logistic regression model, the HBM framework has shown

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