



Socioecological and message framing factors influencing maternal influenza immunization among minority women



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ABSTRACT

Objective: A suboptimal level of seasonal influenza vaccination among pregnant minority women is an intractable public health problem, requiring effective message resonance with this population. We evaluated the effects of randomized exposure to messages which emphasize positive outcomes of vaccination (“gain-frame”), or messages which emphasize negative outcomes of forgoing vaccination (“loss-frame”). We also assessed multilevel social and community factors that influence maternal immunization among racially and ethnically diverse populations.

Study design: Minority pregnant women in metropolitan Atlanta were enrolled in the longitudinal study and randomized to receive intervention or control messages. A postpartum questionnaire administered 30 days postpartum evaluated immunization outcomes following baseline message exposure among the study population. We evaluated key outcomes using bivariate and multivariate analyses.

Results: Neither gain- [OR=0.5176, (95% CI: 0.203,1.322)] nor loss-framed [OR=0.5000, 95% CI: (0.192,1.304)] messages were significantly associated with increased likelihood of immunization during pregnancy. Significant correlates of seasonal influenza immunization during pregnancy included health-care provider recommendation [OR=3.934, 95% CI: (1.331,11.627)], use of hospital-based practices as primary source of prenatal care [OR=2.584, 95% CI: (1.091,6.122)], and perceived interpersonal support for influenza immunization [OR=3.405, 95% CI: (1.412,8.212)].

Conclusion: Dissemination of vaccine education messages via healthcare providers, and cultivating support from social networks, will improve seasonal influenza immunization among pregnant minority women.

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1. Introduction

Influenza virus is a significant contributor to population morbidity and mortality on a global and national scale, particularly among at-risk populations such as pregnant women [1–4]. The American Congress of Obstetricians and Gynecologists (ACOG) and the Advisory Committee on Immunization Practices (ACIP) recommends that pregnant women (and women who expect to be pregnant during the influenza season) receive the trivalent inactivated influenza vaccination [1,2]. Yet, vaccination rates among Hispanic and Black/African-American pregnant women are

significantly lower than those of whites despite persistently higher rates of morbidity, mortality, and hospitalizations due to influenza [3–11].

Improvements in cost and access barriers (e.g. free prenatal care, free vaccines) have not eliminated racial and ethnic disparities in immunization rates among pregnant women. Evidence suggests that perceptions of influenza illness and immunization significantly influence the decision to vaccinate during pregnancy. An array of factors, ranging from individual issues such as previous immunization behavior and attitudes towards vaccination, to patient-provider vaccine communication, and social network influences may impact maternal vaccination decisions [12–16].

1.1. Immunization message framing

Backed by the Prospect Theory, which was developed by psychologists Amos Tversky and Daniel Kahneman [17–20], message

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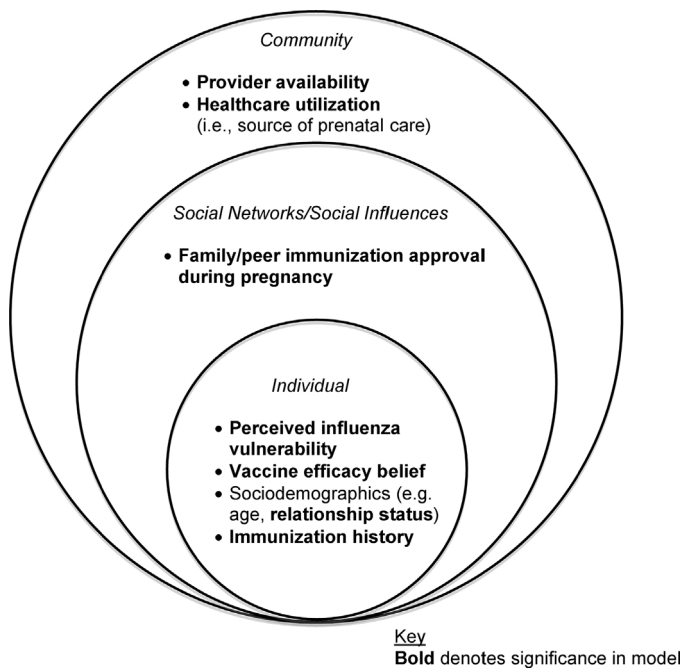


Fig. 1. Socioecological factors associated with influenza immunization among pregnant minority women.

framing has been proposed as a potential method to promote positive health-seeking behavior such as immunization. According to Prospect Theory, individuals tend to avoid risks when considering gains and are willing to take on risks when considering losses [21]. Positively-oriented (“gain-frame”) messages communicate information by emphasizing the benefits of the target health behavior, while negatively-oriented (“loss-frame”) messages emphasize the risks of not engaging in the behavior [16]. Furthermore, gain-frame messages appear to be most persuasive when advocating for preventive health behaviors (e.g., immunization). Loss-frame messages are most persuasive when advocating for a behavior that detects a health problem (e.g., getting a Pap smear) [16,22–26]. Prospect Theory therefore has been previously operationalized in HIV and influenza vaccine studies to understand confluent factors that shape immunization decision-making [26,27].

1.2. Socioecological influences

To examine intersecting factors that contribute to pregnant women’s decision-making when faced with specific immunization messages, we drew upon a socioecological framework for empiric investigation of the dynamic interactions across individual, social network/social influence microsystem, and community levels. Our socioecological model (Fig. 1) posits that individual behavior is influenced and defined by their surrounding ecology, environment, or systems [28]. From a conceptual standpoint, immunization decision-making is informed by a “chain reaction” series of events driven by an entire ecological system including direct and indirect influencers.

This model specifies three key levels of behavioral dynamics. The first level of the system – the individual level – refers to factors that are individually exclusive such as perception of disease vulnerability [28]. The second level, the social network/social influence microsystem, involves peer and family support for immunization decision-making within a person’s immediate surroundings. Interactions at this level are theorized to have a strong impact on individual’s health decision-making due to strong interpersonal dynamics in these relationships [28]. Finally, the community level

represents the healthcare utilization and provider communication on immunization, influences considered driven by structural concerns such as culturally-competent providers and insurance provision in geographic proximity to pregnant women [28].

Multilevel influences guide individual health decisions and attitudes. As a result, message framing effects alone may not be sufficient to promote immunization behaviors among at-risk populations. Individual, social, and community-level factors may significantly sway receptivity of these messages, whether gain- or loss-framed. In addition to understanding the role of message framing in immunization decision-making behavior, we also sought to understand these spheres of influence. By identifying socioecological influences on immunization behavior, we can craft more comprehensive community-based messages to guide pregnant minority women towards health-promoting behaviors [28].

To our knowledge, message framing within a socioecological model of health behavior has not been evaluated on maternal immunization outcomes among minority women. Our study endeavored to test messages that would articulate maternal benefits associated with vaccination (gain-frame) and, conversely, illustrate negative consequences of foregoing immunization (loss-frame) on their decision to obtain the seasonal influenza vaccine [29–31]. Based on previous research, we hypothesized that gain-framed messages would be more effective than loss-framed messages in persuading women to obtain influenza immunization [16,22–25]. We also sought to pinpoint socioecological effects on immunization behavior. Incorporation of these influences in future health campaigns and vaccine messages may promote preventive health behavior of at-risk populations.

2. Materials and methods

2.1. Study design and sample

The study protocol was approved by the Emory University Institutional Review Board. We enrolled 276 women on the basis of achieving at least 80% power to detect a 20% difference between baseline and the two intervention groups. We assumed a baseline immunization rate of approximately 15% with a significance level of $\alpha \leq 0.05$ and 10% attrition at 30 days postpartum follow up. Through data cleaning, we identified four duplicate enrollments. The first set of survey data for each duplicate enrollee was retained for analysis. The baseline survey assessed sociodemographic characteristics, psychosocial factors associated with their intention to immunize themselves and their infants, and message framing influences on their immunization decision-making. The postpartum questionnaire assessed their health during pregnancy, infant outcomes, and receipt of recommended immunizations.

Cohort recruitment began at the inception of influenza season from September 2011 to May 2012. Follow-up began with women due from October 2011 until we reached all women responsive to our survey as they reached the 30-days postpartum milestone, thereby concluding our follow-up by May 2013. Eligible participants included those who self-identified as Black/African American, Hispanic/Latina, and/or Multiracial/multiethnic reflecting lineage in these racial/ethnic categories. They also must have been 18–50 years old, able to read and write English and/or Spanish, and able to provide written informed consent. Women who reported receipt of influenza vaccine during the 2011–2012 influenza season were excluded from the study.

Using venue-based sampling, we approached approximately six hundred women to participate in the study. Those who expressed interest were then asked a brief series of questions to assess their eligibility. Nearly two-thirds of the women were ineligible for enrollment based on preset criteria such as age, ability to read and write English and/or Spanish, and previous receipt of the seasonal

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