Decisional balance and self-efficacy mediate the association among provider advice, health literacy and cervical cancer screening

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ABSTRACT

Purpose: Health literacy has emerged as a potential determinant of cancer screening, yet limited literature has investigated the pathways which health literacy influences Pap tests among immigrant women who experience a higher incidence of cervical cancer. This study aimed to test a health literacy-focused sociocognitive model which proposes motivational (knowledge, decisional balance) and volitional (self-efficacy) factors mediating the association between health literacy and triennial Pap tests.

Methods: Using structural equation modeling, we conducted a secondary analysis of baseline data obtained from a randomized controlled trial to promote breast and cervical cancer screenings among 560 Korean American women 21–65 years of age. They were interviewed on demographics such as education and English proficiency, provider advice, health literacy, knowledge of cervical cancer, decisional balance for Pap tests, self-efficacy, and Pap test use.

Results: Higher health literacy predicted high level of knowledge and high decisional balance score, and greater self-efficacy and then only decisional balance and self-efficacy affected Pap tests. High level of knowledge predicted Pap tests through its impact on the decisional balance score. Receiving provider advice both directly and indirectly predicted Pap tests through high level of health literacy, high level of decisional balance and greater self-efficacy.

Conclusions: Findings from this study suggest possible pathways through which provider advice and health literacy affect Pap tests. Interventions targeting immigrant women with limited English proficiency should consider skill-based approaches such as health literacy training, promoting patient-provider communications and emphasizing decisional balance and self-efficacy as potentially sustainable ways of promoting Pap tests.

1. Introduction

In the 2010 U.S. census, the Asian population was one of the fastest-growing ethnic groups, due in large part to immigration (Humes et al., 2011). In particular, the Korean American population, the fifth largest Asian American group, more than tripled in size between 1980 and 2010 whereas the total U.S. population grew by only 38% during the same period (Ryan, 2013). Given these demographic trends, special consideration should be given to the health concerns of the growing Korean American population.

Cervical cancer is the fourth most common cancer in women worldwide. More than half a million women are diagnosed each year, and approximately 87% of cervical cancer-related deaths occur in developing countries (Ferlay et al., 2015). Although developed countries have implemented effective early detection strategies, cervical cancer incidence and mortality rates remain high among certain racial/minority women in the U.S. which is most often related to a lack of regular screenings (Chawla et al., 2015; Miller et al., 2008; Vesco et al., 2011; Wang et al., 2010). For example, although Hispanic women had the highest incidence of cervical cancer (16.6 per 100,000), the incidence rate for cervical cancer was 11.9 per 100,000 Korean American women (KAW), which is higher than that of their non-Hispanic white and black counterparts (7.9 and 9.9 per 100,000, respectively; Wang et al., 2010). In addition, KAW were 1.5 times more likely to die from it than were their non-Hispanic white counterparts (Miller et al., 2008). Regular Papanicolaou (Pap) tests are considered an essential strategy for the early detection and treatment of cervical cancer in a timely manner. National practice guidelines recommend receiving a Pap test at least

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every three years for average-risk women 21–65 years of age (U.S. Preventive Services Task Force, 2012). Yet only about 70% of KAW have received a triennial Pap test, compared to 89% of non-Hispanic white women and 92% of non-Hispanic black women (Chawla et al., 2015).

Although nearly half of all American adults (90 million) face challenges in health literacy (HL), limited English proficient populations are particularly affected by limited HL (e.g., 75% of KAW; Han et al., 2011). Evidence indicates that low HL is an independent predictor of limited health-related knowledge and self-efficacy, low perceived benefits and high perceived barriers, and inadequate health behaviors, including a lower probability of mammogram screening, colorectal cancer screening, influenza vaccination (Berkman et al., 2011; van der Heide et al., 2015). Berkman et al. (2011) argued that HL explains some disparities in health outcomes, such as self-rated health status and preventive health behaviors. The review also highlights the potential role of HL as a means of overcoming health disparities, such as those in cervical cancer (Berkman et al., 2011).

Despite a growing body of research that has revealed the critical role of HL in Pap test use among English- and Spanish-speaking women (Kim and Han, 2016), only two studies have examined the association between HL and Pap test use among Asian women (Lee et al., 2012; Sentell et al., 2015). HL was a significant correlate of health knowledge and Pap test use among Taiwanese women (Lee et al., 2012); however, the study was conducted in Taiwan, where a national healthcare system has been established and the majority of women use their national language, Mandarin. Based on data from the 2007 California Health Interview Survey, the association between HL and triennial Pap screening was non-significant among Chinese American women (Sentell et al., 2015), but the study looked at HL using only two items: written information at a doctor's office and instructions on a prescription bottle. No theoretical framework was used in the study to justify the selection of the study variables (Sentell et al., 2015). More theory-based systematic research is needed to establish a clear link between HL and Pap test use among limited English proficient Asians in the U.S. von Wagner et al. (2009b) proposed the framework of HL and health actions by integrating the concept of HL and system factors into established constructs from social cognition models of health actions (e.g., knowledge, decisional balance, self-efficacy). Thus, the framework offers a unique and comprehensive way of understanding the pathways through which HL and system factors such as providers' advice influence one's health behaviors, such as Pap test use. Decisional balance – weighing perceived benefits of doing a target behavior (i.e., Pap test use) against perceived barriers that get in the way (Rakowski et al., 1997) is a critical concept to explain the process of adopting a target behavior in relation to HL (Levesque et al., 2006). In addition, self-efficacy – an individuals' ability to exercise control over his or her health habits (Bandura, 1997) has shown to link HL and participation in certain cancer screening behaviors (van der Heide et al., 2015). For example, in the context of colorectal cancer control, researchers have identified plausible indirect pathways between HL and participation in colorectal cancer screening through psychosocial constructs such as decisional balance and self-efficacy (van der Heide et al., 2015; von Wagner et al., 2009a). Understanding the mechanism linking HL and system factors and Pap test use could provide useful knowledge for the development and modification of interventions. Yet, to the best of our knowledge, no study has investigated indirect pathways that link HL and system factors to Pap test use.

1.1. Purpose of the study and hypotheses

The purpose of the present study was to test the HL-focused, sociocognitive framework for KAW's Pap test use (Fig. 1). The primary aim of this study was to examine pathways through which HL affects KAW's triennial Pap test use. We investigated the following hypotheses:

Hypothesis 1-1. HL would be positively associated with triennial Pap test use among KAW.

Hypothesis 1-2. Cervical cancer knowledge, decisional balance for Pap tests, and cervical cancer self-efficacy would mediate the association between HL and Pap test use.

Namely, that HL would be positively associated with greater cervical cancer knowledge, greater perceived benefits of and fewer perceived barriers to Pap test use, and higher self-efficacy, which would in turn be associated with KAW's Pap test use.

Our secondary aim was to examine the effects of a provider's advice on HL, psychosocial determinants (e.g., cervical cancer knowledge, decisional balance, and self-efficacy) and KAW's Pap test use. The following hypotheses were investigated:

Hypothesis 2-1. A provider's advice would be positively associated with KAW's Pap test use.

Hypothesis 2-2. The association between a provider's advice and Pap test use would be mediated by HL and cervical cancer knowledge, decisional balance, and self-efficacy.

2. Methods

2.1. Parent study

2.1.1. Design
A cluster randomized-controlled trial was designed to test the effectiveness of a community health worker (CHW)-led HL intervention on mammogram and Pap tests among KAW in a northeastern metropolitan area in the U.S.

2.1.2. Subjects and setting
Details about the parent study design have been published elsewhere (Han et al., 2017). In brief, 29 female CHWs from 23 ethnic churches in the northeastern region of the U.S. were trained to recruit KAW from their respective churches. Eligible KAW were 21–65 years of age, able to read and write English or Korean, two years overdue for age-appropriate breast and/or cervical cancer screening, and willing to provide written consent to allow researchers to audit medical records. CHWs also delivered the intervention including HL education, monthly telephone follow-up, and navigation services for 6 months. A total of 560 eligible KAW completed the survey at baseline. Follow-up data were collected after three and six months. Baseline data were collected between March 2010 and April 2011.

2.1.3. Procedures
Following the identification of potential participants by trained CHWs, trained bilingual research staff provided a brief explanation about the study and verified the eligibility of the women. The staff then obtained written informed consent and administered the study questionnaire. Procedures to assess HL among KAW are reported elsewhere (Han et al., 2014). In brief, the survey was a paper-pencil questionnaire including HL, psychosocial determinants (e.g., breast and cervical cancer knowledge, decisional balance, and self-efficacy) and self-reported mammogram and Pap test use at baseline. Mammogram and Pap test use at 6 months was measured via a medical record review. English survey instruments (e.g., decisional balance, self-efficacy) were translated into Korean and reviewed by a team of bilingual researchers. Any discrepancy was discussed until consensus was reached. In the case of HL scale, while all instructions were written in Korean, all items were written in English (Han et al., 2014) because the previous validation study reported that the Korean-translated version of the Rapid Estimate Adult Literacy in Medicine (REALM) and the Test of Functional Health Literacy in Adults did not capture the concept of HL in KAW whose primary language is phonetic (individuals can pronounce a word as