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Promoting breast cancer screening among Chinese American women through young children's theatrical performance

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ABSTRACT

Promoting Breast Cancer Screening Among Chinese American Women
Through Young Children's Theatrical Performance

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MPH, San Jose University, 1987
BS, San Francisco State University, 1984

Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
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ABSTRACT

Research has revealed that underutilization of breast cancer screening by ethnic minorities often is related to language difficulties and cultural values and beliefs about cancer. The problem addressed in this secondary data analysis was the late diagnosis of breast cancer in the Chinese immigrant community. The purpose of the quasi-experimental study was to test the efficacy of a theatrical preschool performance, guided by the diffusion of innovation theory, in educating Chinese American women about breast cancer detection. The research questions sought to determine whether the performance increased the participants' knowledge of breast cancer screening guidelines and whether country of origin, length of stay in the United States, and self-reported attentiveness were associated with knowledge gain of breast cancer screening guidelines. The preschool performance was performed by Chinese children ages 3 to 5 who displayed breast health guidelines from the Susan G. Komen for the Cure. One hundred and seventy-seven pre- and postperformance surveys were collected from a sample of Chinese women (84% foreign born). The secondary data were analyzed using standard linear regression analyses and bivariate logistic regressions. The findings demonstrated that promoting breast health screening guidelines among Chinese American women through a preschool theatrical performance significantly increased the participants' knowledge of the guidelines. However, no major impact was detected between knowledge score and attentiveness to the theatrical performance and any of the demographic variables. Health care professionals can foster social change by adapting a preschool theatrical performance to educate ethnic communities on cancer control guidelines for early detection.

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CHAPTER 1: INTRODUCTION TO THE STUDY

Introduction

According to the U.S. Department of Health and Human Services (2007), cancer is the leading cause of death among Asian Americans and Pacific Islanders. Breast cancer is the leading cause of cancer death and accountable for the highest incidence rate of all cancers within the Chinese American population (American Cancer Society [ACS], 2008b; Ries, Miller, & Hartman, 1991). Since 1992, the U.S. female breast cancer death rate has remained relatively unchanged among Asian Pacific Islander (API) women in the United States (ACS, 2008a). Data from the National Cancer Institute's (2007) Surveillance Epidemiology and End Results Program for 2001-2005 indicated that the breast cancer rate among API women was 89.6 per 100,000. Although compared to women from other ethnic groups, such as European American and African American, Asian Americans have a lower breast cancer incidence rate, they experience a much higher breast cancer mortality rate because of late-stage diagnosis.

Early detection is the key to reducing the breast cancer mortality rate and prolonging the length of survival. The ACS (2008a) reported that because of improvements in the early detection and treatment of breast cancer, the mortality rate from this disease among U.S. women decreased by 2.2% annually between 1990 and 2004, and the mortality rate among women ages 50 and older decreased by 2% per year. Currently, routine mammography screening, the most effective way to detect early breast cancer, can identify cancer several years before physical symptoms appear (ACS, 2008a). Although an increase in mammography screening among non-Hispanic White women has

been observed, comparable shifts have not been observed in minority women (Brownstein, Cheal, Ackermann, Bassford, & Campos-Outcalt, 1992; Hoare, 1996; Sadler, Ryujin, Ko, & Nguyen, 2001). Tu et al. (2003) suggested that nearly 40% of Chinese American women over the age of 40 have not had a mammogram in the last year.

Although major efforts have been made to educate non-Hispanic White women about breast cancer, screen them regularly, treat the cancers detected promptly, and rehabilitate the survivors, cancer control efforts targeting API populations have been inadequate (Jenkins & Kagawa-Singer, 1994). Studies have suggested that factors such as language and cultural barriers contribute to the lack of participation in cancer screening by Asian American women (H. H. Do et al., 2007; Gomez, Tan, Keegan, & Clarke, 2007). In a study of Chinese women in seniors' centers (median age 71.81 years), Tang, Solomon, and McCraken (2000) also found acculturation, as measured by age at immigration and use of native and English languages, to be a significant predictor of ever having a mammogram and a clinical breast examination (CBE). Chapter 2 discusses the research in more detail.

Theatrical plays or drama has been used as a teaching mechanism to overcome language and cultural barriers in educating underserved populations on health issues (M. P. Do & Kincaid, 2006; Piotrow et al., 1992). Mbizvo (2006) stated that the content of any theatrical performance should be based on the assessment of the target audience's knowledge, cultural beliefs and practices, and barriers to behavior change. Although no data are available on the involvement of young children in theatrical plays to influence

adults' cancer-related knowledge, attitudes, and practices, Polish researchers did conclude that children's knowledge about nutrition can affect their parents' dietary behavior (Kozlowska-Wojciechowska, Uramowska-Zyto, Jarosz, & Makarewicz-Wujec, 2002). Studies in India also have demonstrated that children's knowledge about leprosy influences their parents' attitudes toward this disease (Bhore et al., 1992; Jacob, Amar, Christopher, & Keystone, 1994). The findings from these studies suggested that preschool children may be able to influence adults' attitudes and practices related to early cancer detection. This researcher conducted a secondary analysis of quantitative data collected in a quasi-experimental study of preschool theatrical performances that took place in 2005.

Statement of the Problem

The problem addressed in this study was the late diagnosis of breast cancer in the Chinese immigrant community (ACS, 2006). Many factors can contribute to a late diagnosis. The focus of this study was on the factor associated with the lack of a culturally competent program that addresses cultural beliefs and barriers in breast health education. The study addressed this problem by testing the efficacy of involving young children as change agents through theatrical preschool performances to influence adults' attitudes toward their practices related to the early detection of breast cancer.

Cancer is the leading cause of death for Asian American females in the United States, and breast cancer is the most common cancer among Chinese American women in California (ACS, 2008b). The Asian American and Pacific Islander (AAPI) population are the only group that has experienced a statistically significant (20%) increase in the

incidence rate of invasive breast cancer in the past decade ("Comprehensive Cancer Control in California," 2004). The rise in the incidence rate of invasive breast cancer is possibly due to AAPI women's unfamiliarity with the breast health guidelines (Sadler, Wang, Wang, & Ko, 2000).

Purpose of the Study

The purpose of the study was to test whether a culturally and linguistically competent cancer control program, guided by the diffusion of innovation theory (Rogers, 1962), can raise awareness among Chinese immigrant women about the breast cancer screening guidelines published by the Susan G. Komen for the Cure (2008). These guidelines are to practice breast self-examination (BSE) monthly if age 20 or older, (b) have a mammogram annually if age 40 or older, and (c) have a breast exam performed by a health care provider every 3 years if ages 20 to 39 and annually if ages 40 or older

Theoretical Framework

In Rogers's (1962) diffusion of innovation theory, he described diffusion as the process by which an innovation is communicated through channels over time among members of a social system. According to Rogers, the diffusion process involves four primary elements: (a) an innovation, which is an idea, a practice, or an object; (b) communication channels, the means by which messages are transferred from one individual or group to another; (c) the time required for adoption of the innovation; and (d) the social system, which is a set of interrelated units engaged in achieving a common goal. Members of the social system are classified in five categories based on when they adopt the innovation: innovators, early adopters, early majority, late majority, and

laggards. Davies and Macdowall (2006) indicated that the characteristics of these groups are compatible with their socioeconomic status and cultural values. Individuals who are innovators, early adopters, and in the early majority are amenable to change and have some personal, social, or financial resources to adopt the innovation. Late adopters and laggards are skeptical, cautious, and economically limited (Davies & Macdowall, 2006).

Cultural values relate to five characteristics of an innovation that relate to decision making about its adoption (Rogers, 2002). Relative advantage means that the innovation is viewed as providing greater benefit or advantage than current practice. Compatibility is the degree to which the innovation is seen as consistent with the potential users' existing values, previous experiences, and needs. Complexity represents the level of difficulty in understanding the innovation and its ease of use: simplicity and flexibility encourage adoption (Davies & Macdowall, 2006). Trialability refers to the degree to which the innovation can be tested before permanent adoption. Observability is the extent to which the results of adopting the innovation, both benefits and risks, can be observed.

The change agent or champion who promotes the adoption of an innovation is another critical factor that can affect the adoption rate (Rogers, 2002). This change agent may be an internal member of the social system or an external individual or group working with the population of interest. The appropriate selection of the change agent can accelerate the rate of adoption within a community. In summary, the diffusion of innovation theory (Rogers, 1962) provides useful guidance on how to introduce new cancer control guidelines into a community. Chapter 2 provides more empirical evidence supporting this theory and its role in breast cancer screening.

Nature of the Study

Most parents and grandparents adore their children and pay close attention to their well-being at school. In the Chinese community, nearly all family members have great respect for the schools and are appreciative of the work of the teachers. Hence, it is a common practice for Chinese preschools to hold special performances during graduation ceremonies and as special events. As part of the presentation, preschoolers recite Chinese poems and songs, and they perform for their parents and relatives. Most parents and close relatives of the preschoolers make an effort to attend such functions and pay close attention to their children's performance. Therefore, it would seem that such performances involving children as change agents could be an excellent opportunity and cultural environment to deliver health messages to the parents and relatives of preschoolers. Although the preschoolers may not fully grasp the specific content in the messages, they are aware of simple concepts such as sickness and checkups. Parents and relatives are likely to absorb the health messages, particularly when the schools and reputable health care organizations endorse them.

This study tested this concept by conducting a secondary data analysis of selected information collected in relation to a set of preschool theatrical performances in 2005. That year, a community-based health resource center, in collaboration with five preschools that serve the Chinese immigrant community, conducted preschool theatrical performances in an effort to raise awareness about breast cancer screening guidelines among Chinese immigrant women. Pre- and postsurveys were administered to the mothers and other adult females in the audience immediately before and after each

performance (see Appendix). Prior to conducting the study, institutional review board (IRB) approval was granted by a local hospital. However, because of limited funding for this project, data analysis at that time was restricted to examining the frequency distributions of the answers to the survey questions. Chapter 3 provides detailed descriptions of the intervention and survey instruments.

Research Questions and Hypotheses

1. Did a theatrical preschool performance increase the study participants' knowledge of breast cancer screening guidelines?
2. Were acculturation and attentiveness to the performance associated with the study participants' knowledge gain?

H_{01}: After watching the theatrical preschool performance, the participants will not score higher on knowledge of the Susan G. Komen for the Cure's breast health guidelines at posttest than at pretest.

H_{a1}: After watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest.

H_{02}: The participants' knowledge score at posttest will not be positively associated with self-reported acculturation and attentiveness to the theatrical performance.

H_{a2}: The participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance.

Aims of the Study

The primary aim of the study was to assess whether engaging young children as change agents in preschool theatrical performance is an effective tool to promote breast cancer screening to Chinese American women. Secondary aims were to examine the factors associated with the participants' knowledge and the reported level of attention paid to the breast health messages in the preschool performance. These factors included demographics (i.e., age, marital status, education, and annual household income); acculturation (birthplace and length of stay in the United States); health insurance status as an indicator of service access, and the relationship of the participants to the preschoolers. The data analysis is discussed in chapter 3.

Definitions of Terms

Acculturation: Acculturation is the process through which an individual who continuously encounters another culture acquires its values, attitudes, and behaviors (Cheung-Blunden & Juang, 2008).

Attentiveness: Attentiveness is an individual's reaction to a stimulus, as expressed in responsiveness and demeanor (Stuart & Tax, 1996), as well as willingness and receptiveness (Friedman, 1994).

Breast cancer screening guidelines: Breast cancer screening guidelines are recommendations for early breast cancer detection issued by the Susan G. Komen for the Cure (2008) that are focused on breast health.

Diffusion of innovation theory: The diffusion of innovation theory is a set of propositions about the process through which an innovation spreads through various channels over time to members of a social system (Rogers, 1962).

Significance of the Study

This study will contribute new knowledge about the efficacy of involving young children in a theatrical performance to raise awareness of breast cancer screening guidelines among Chinese American women. The findings will contribute to filling gaps in the literature about the role of young children as change agents in delivering important health messages in culturally competent ways. If this intervention is shown to be effective in raising awareness of breast cancer screening guidelines, this method can then be adopted by other communities and used to deliver other health messages.

Implications for Social Change

Social change at the structural level usually involves a mobilization of mass public support. Collins, Giles, and Holmes-Chavez (2007) suggested that to achieve social changes that will reduce health disparities within underserved populations, health educators need to understand the target population's culture, beliefs, and attitudes concerning health. Similarly, Siegel and Doner (2004) suggested that the key to being an effective public health practitioner is to abandon the tendency of deciding what would convince the public and to replace it with market research to identify the basic needs, desires, and core values of the target population. Thus, to attain sustainable behavioral change in cancer control, the information presented must incorporate the specific sociocultural conditions of the intended audience (Ruzek & Hill, 1986).

The findings of the study will contribute to filling a gap in the literature regarding the ways in which young children can influence their parents and relatives to learn about breast health guidelines. Public health administrators and educators will be able to adopt this approach in designing and implementing effective interventions specifically tailored to Chinese immigrant women. In addition, other health care professionals can test whether this type of program is effective in educating other ethnic communities about cancer control issues. Developing culturally competent cancer control programs is essential in engaging the population in cancer education and influencing decisions to comply with early cancer detection recommendations. Increased compliance with cancer screening guidelines may lead to reductions in cancer mortality.

Assumptions

The researcher assumed that prior to the preschool performance, the study participants had received messages about breast health guidelines and breast cancer screening through conventional channels such as health brochures, videos, and seminars. However, a few of the participants may never have read a health brochure, seen a video, or attended any health seminar that conveyed screening recommendations. Another assumption is that all of the participants understood the meaning of breast cancer and the messages delivered through the preschool performances.

Limitations

This study had several limitations. First, the data were collected from a convenience sample of Chinese American women instead of a randomized sample. Therefore, the sample may not represent all Chinese women with young children in the

region of the study or elsewhere in the United States. Second, the study design did not include a control group to ensure that knowledge gain about breast cancer screening guidelines was, indeed, because of the preschool theatrical intervention. Other concurrent messages and events might have affected the women's awareness. Third, the reliability of the instrument was not tested. Fourth, answers to the study questionnaire were self-reported. McPhee et al. (2002) pointed out that culturally, women from some Asian ethnicities may have a greater tendency than White women to provide socially acceptable responses, so reliance on the participants' self-reports may have overestimated cancer screening rates. Fifth, the order of response options to Question 1 in the pre- and posttest questionnaire also may have biased responses. Because these options were grouped by categories of BSE, CBE, and mammography, a good test taker could utilize the process of elimination to obtain the correct answer. However, the demographic characteristics of the target population suggested that very few participants were at such a sophisticated test-taking level. Sixth, the researcher may not have controlled for all confounding factors that influenced the outcomes observed. Finally, this study examined the effects of preschool performance of knowledge of breast cancer screening guidelines, but it did not assess the extent to which the participants translated this knowledge into action.

Summary

Epidemiological findings have revealed significant contrasts in breast cancer incidence and mortality rates among women from different ethnic groups in the United States. Although the incidence of breast cancer is lower among Asian American females than among women from other ethnic groups, the Asian American mortality rate from

this disease is much higher. These data have suggested that breast cancer in Asian American women tends to be diagnosed at a later stage, which points toward the possible existence of language and cultural barriers to the adequate utilization of cancer screening, such as such as mammograms, by this population. Several studies have confirmed the existence of such barriers, including the lack of culturally competent programs providing breast health education. The researcher conducted a secondary analysis of data from a research project guided by Rogers's (1962) diffusion of innovation theory to determine whether involving Chinese American preschool children in theatrical performance increased awareness of breast cancer screening guidelines among female members of the audience. The next four chapters will include a review of cross-cultural studies that have investigated ethnic differences regarding the meaning of cancer, illness-coping strategies, attitudes toward death and dying, and the theoretical framework for the study; research methodology used in the study; results of the study, and a discussion of the results.

CHAPTER 2: REVIEW OF LITERATURE

Introduction

Despite a wealth of literature on breast health education and strategies for promoting breast cancer awareness among women, there is a dearth of literature, whether theoretical or empirical, on the extent to which young children can contribute to their mothers' breast health awareness. This chapter divides the review of the literature related to the study into two parts. The first part focuses on cultural barriers to the promotion of cancer awareness among Chinese immigrant females and empirical support for the role of Rogers's (1962) diffusion of innovation theory related to cancer screening. Because of the lack of empirical studies on young children's influence on their parents' behavior in cancer screening through theatrical performance, the second part of the review focuses on studies of the influence that children have on changes in their parents' attitudes and behavior, especially those related to health and the efficacy of using drama in health promotion.

Strategies for Searching the Literature

Keywords used to search for the literature included the following: breast cancer education; kid involvement; children as teachers, preschool study; preschooler; kids; children; Chinese preschool study; kids ages 3 to 5; health education; child/kid performance; child/kid theatrical performance; kid performance and parent attention; Chinese preschool; Chinese preschooler, child-parent communication; child-parent relationship; child-parent reciprocal communication; reciprocity child-patent mutual communication; child-parent bidirectional communication; family dynamic; family child

communication; child-parent communication; child-parent interaction; homework; tutor; child teaches adults; andragogy; child involvement; child/kid/children involvement; child conveys message; child potency; child persuasion; child persuasiveness; child influence; child communication, child communication; parent response; children/kids to promote health message; child-directed communication; parent behavior change; communication in early infancy; preverbal communication; health promotion through children; child as conduit of communication; child as conduit of health message; children as elicitors; child manipulation; mass media communication; mass media intervention; mass media campaign; marketing to children; advertising persuasion; child-specific advertising; advertisement; children as consumers; buyers; children as decision-markers; psychology and marketing; strategic communication about behavior; health message framing; message recipients; judgment formation; decision-making behavior; communicating behavioral changes; persuasive message characteristics; health behavior; cultural/global social change; public health; translocational model; child-driven model; innovation diffusion; social info processing model, critical theory, and persuasion theory; theater and health education; and theater and cancer education.

Search engines that were accessed to find relevant literature included the following:

Internet search engines and websites: Yahoo, Google, Google Scholar; highwire.stanford.edu; freemedicaljournals.com; online.argosy.edu; HighBeam.com; sapiens.net; and electronic journals.

SFSU system: LexisNexis; ProQuest; ScienceDirect; PubMed; WorldCat; Web of Science; Wiley InterScience; Academic Search Premier; PsycINFO (Psychology); ERIC (EBSCO); CINAHL (Nursing); journal@OvidFullText; JSTOR (older journals); and other databases and online journals.

SJSU system: Annual Reviews; Ingenta; PubMed; Sage Journals Online (Sage Premier); ScienceDirect; Wiley Interscience.

UCSF system: PubMed@UCSF; CINAHL (Nursing); CINAHL Plus; PsycINFO (Psychology); MEDline Plus; MICROMEDEX; MD Consult; AccessMedicine; STAT!Ref-Medical; Science Citation Index; MELVYL; PsycARTICLES; SocAbstract; Social Service Abstracts; and other databases and online journals.

Culture, Health, and Cancer

According to the ACS (2007), culture contributes to cancer disparities. Spector (1991) defined culture as "the sum of beliefs, practices, habits, likes, dislikes, norms, customs, and rituals shared by a group of people" (p. 61) Culture is revealed through the unique shared values, beliefs, and practices in a population or subgroup that are directly or indirectly associated with health-related behavior (Pasick, D'Onofrio, & Otero-Sabogal, 1996). Kagawa-Singer (1996) defined culture as a tool that operationalizes a specific group's worldview into symbols of values, beliefs, and practices that the members of a cultural group learn to use to ensure their well-being. Each cultural group is different in how it defines health and well-being; perceives the causes of disease, misfortune, and death (Spector, 2002); and identifies appropriate preventive health activities and effective treatment strategies to ensure the survival and well-being of its

members (Kagawa-Singer, 1996). Therefore, familiarity with the history, values, beliefs, and practices of ethnic minority individuals can be helpful in identifying the cultures that they represent and in understanding how patients and families in each culture interpret the causes of cancer and the recommended regimens for cancer prevention, screening, and treatment. As Kagawa-Singer noted, patients will adopt recommended medical regimens only when these recommendations fit into their belief systems and are relevant to their lives at a specific point in time, when they see that recommended changes are worth trying, and when they have the resources to do so.

Health behaviors and practices are the outcomes of knowledge, attitudes, and beliefs embedded in the context of life circumstances and experiences (Pasick, 1997). Individuals from a specific cultural background may have very different values and beliefs than their health care providers. For example, Ma (2000) found that when Mainland Chinese and Taiwanese individuals seek health care, they share similar beliefs about health, health care, and illness, and they experience similar barriers, including communication difficulties with and mistrust of Western health care. Confusion, frustration, and miscommunication experienced by ethnic minority patients are common.

The concepts of disease prevention and early detection do not exist in many cultures. A study of Asian women in Iran found that many were not aware of the importance of regular breast cancer screening and that major inhibitors to their participation in screening included cultural attitudes toward screening tests, modesty, and a lack of encouragement by family members and physicians (Parsa, Kandiah, Rahman, & Zulkefli, 2006). In-depth interviews in Cantonese with 20 Australian Chinese women

found that meanings of the breast were constructed within a social and cultural context, where breasts are associated with sex and where talking about, being concerned with, or expressing curiosity about breasts is considered inappropriate. These views had a significant impact on the way that the informants viewed breast cancer and breast health practices (Kwok, Sullivan, & Cant, 2006).

When disease is suspected or does actually occur, it is important for health care providers to differentiate between disease and illness and to understand that they and their patients perceive disease and illness differently. Whereas disease concerns the observable aspects of cancer based on the nosology of the health care system, illness is the subjective meaning of the experience related to the disease. The meaning attributed to experience with cancer is very much dependent upon patient and family cultural values, as well as the symptoms they have experienced (Kagawa-Singer, 1996). Individuals of different cultural groups and societies embody illnesses in many different ways.

Gordon (1990) explored the meaning and experience of breast cancer among women throughout various phases of the illness and concluded that culture influences the patient's beliefs regarding the meaning of cancer; her emotional and physical response to treatment; the side effects of treatment reported; the perception of pain; attitudes toward suffering, death, and dying; patterns of decision making; and patterns of family communication used by the patient to cope with the entire experience. Cross-cultural studies also have shown that culture affects how symptoms are manifested when individuals are in physical, emotional, or psychological pain; when help and services are being sought for each type of pain; what healing or treatment procedures are considered

acceptable; and when expectations are held by the healer and help seeker, as well as the meaning ascribed to the return to health, or a feeling of well-being (Amodeo & Jones, 1998; Pedersen, Draguns, Lonner, & Trimble, 1996).

Although cultural factors can enhance or impede participation in cancer education and control activities, several studies have found that barriers to cancer screening and early detection are more common among cultural minority groups (Kagawa-Singer, 1995; Liang, Yuan, Mandelblatt, & Pasick, 2004; Spector, 1991; Yi, 1994). Many factors influence the extent to which members of a specific culture participate in cancer prevention and screening, including birthplace and level of acculturation or assimilation to the new host society (Hedeen, White, & Taylor, 1999); cultural attitudes toward bodily functions and the power of indigenous healers (McBride et al., 1998); general and cancer-specific beliefs and practices concerning health, diet, and access to screening; and expectations concerning the quality of patient-provider interactions and communication in the health care setting (Liang et al., 2004; Olsen & Frank-Stromborg, 1993). The underutilization of cancer screening services among ethnic minorities often is attributed to such factors as language difficulties, cultural values and beliefs, and fear of cancer (Hoeman, Ku, & Ohl, 1996). Studies have confirmed that the unavailability of cancer information in the Chinese language, as well as the absence of culturally specific educational campaigns targeting Chinese immigrant women, contributes to a lack of preventive breast health (Hoeman et al., 1996; Lee, 1998).

Culture has implications for the design, implementation, and effectiveness of cancer education and intervention in many different ways. Cultural factors play an

important role in which a specific population would be identified, targeted, and intervened. Pasick et al. (1996) found that the level of acculturation (i.e., the extent to which values, attitudes, and behaviors from another culture are being adopted, as measured by ethnic and language identification) is associated with different health practices and outcomes. The cultural dynamic also shapes the process and outcome of interventions designed to promote self-care behaviors (Langer, 1999). Implementing an intervention in a culturally appropriate context requires in-depth knowledge of its meaning, feasibility, and acceptability to the target group; its feasibility and acceptance in the target group; and the methods being used for community education or media outreach (Pasick et al., 1996). A thorough understanding of the cultural characteristics of the target population, as well as how those characteristics affect health behavior, is important to ensure the success of interventions.

In designing cancer education and health promotion activities, Pasick et al. (1996) recommended "cultural tailoring," or the development of interventions, strategies, messages, and health materials to conform with specific cultural characteristics, rather than "cultural targeting," or the identification of a population subgroup for the purpose of ensuring exposure of that subgroup to the intervention. Pasick et al. argued that cultural tailoring allows health care providers and health educators to move from beneath the surface of race and ethnicity to those factors that directly influence behavior and health.

Beliefs and Attitudes Toward Preventive Care, Cancer, and Cancer Screening

Cultural values, beliefs, attitudes, and personal experiences affect a person's reaction to illness, health maintenance, daily activities, changes in life, and various health

promotion and treatment practices (Lasky & Martz, 1993). In the United States, health care practice often is guided by a scientific, evidence-based, biomedical approach (Kagawa-Singer, 1996). It is questionable whether this approach to cancer screening and treatment is applicable to Chinese immigrants who are seeking health care according to their specific cultural beliefs and personal practice (Kagawa-Singer, 1996). Lasky and Martz pointed out that health care professionals need to be sensitive to their own cultural backgrounds and health beliefs, and understand how these affect their practice. Otherwise, they may misunderstand their patients, miss valuable diagnostic cues, and encounter higher rates of patient noncompliance with cancer screening guidelines.

Therefore, understanding the notion of preventive care and the meaning of cancer in the Chinese culture, as well as the specific health beliefs and practices of the Chinese immigrant population, is essential in promoting cancer screening services and care. Varricchio (1987) argued that it is equally important to incorporate these specific health beliefs and practices of individuals into service delivery. An important first step in cancer education and treatment is to recognize that the American health care system is itself a cultural system that reflects American values, which may be very different from the values espoused in the Asian culture (Kagawa-Singer, 1996). The basic value of the American health care system is founded on the Judeo-Christian beliefs that life is sacred and should be preserved at all costs; individual, autonomous decision making should be emphasized and supported; and nobody should suffer (Silberfarb, 1982). In contrast, the health care values held by many Asians and Japanese Americans are that individual life is

not sacred, the welfare of the group and the community is more important, decisions are made by group consensus, and suffering in life is inevitable (Kagawa-Singer, 1996).

The Chinese culture has a long history and tradition distinct from that of Western culture. Chinese culture has been strongly influenced by the teachings of Buddhism, Confucianism, and Taoism, which impact the lives of Chinese in a manner unlike that of Western philosophies or religions (Y. D. Chen, 1996; Ino & Glicken, 1999; Uba, 1994). Health care values held by most Asians and Chinese emphasize harmony, respect, self-control, yin-yang balance, other-orientation, interdependency, collectivism, and community (Ino & Glicken, 1999; Spector, 1991), whereas Western values encourage confrontation, independence, and autonomy in individual behavior (Ma, 1999). According to Wu (1995), Chinese culture, as a way of thinking, appears to influence the state of mind and body, parent-child interactions, social relationships, individual and group aspirations, and health-seeking behaviors.

The basic tenet of Buddhism is that all life is suffering and that suffering originates from inappropriate desires (Ino & Glicken, 1999; Rodgers & Yen, 2002; Weidner, 2001). This belief is contrary to the basic philosophy of the American health care system that nobody should suffer (Kagawa-Singer, 1996). Buddhism believes that all living beings are doomed to ride the "wheel of life" through endless cycles of birth, growth, maturity, aging, illness, and death unless they seek the enlightenment of Buddhism (Rodgers & Yen, 2002; Weidner, 2001). Buddhism stresses seeking enlightenment by avoiding inappropriate desires, diligence, and selflessness (Kagawa-Singer, 1996). Therefore, emotional restraint and coping with life's suffering, such as the

contraction of cancer, for the quality of one's next life have special implications in the Chinese culture (Ino & Glicken, 1999).

Like Buddhism, Confucianism is an integral part of Chinese culture and beliefs. Confucianism teaches the importance of family and the virtue of the individual, as illuminated by observing the basic relationships of society as well as maintaining social harmony at all levels of society (Ino & Glicken, 1999; Spector, 1991). Filial piety and respect for elders are central to Confucian thought and practice. Collectivist values in Confucianism emphasize that the common good and the pursuits and needs of the community take precedence over the pursuits and needs of the individual.

Collectivist values, contrary to individualist values in the West, affect the health beliefs and health behaviors of Asian Americans in many ways (Pasick et al., 1996). First, collectivists see the entire family as the most credible source of health information. Therefore, one models one's health behavior after family members, as opposed to the individualistic perspective, which sees health care providers and unrelated others as having greater credibility (Pasick et al., 1996). Most cancer support services in the United States encourage the individual to be self-sufficient and autonomous in decision making, even when sick. However, self-sufficiency and individual autonomy are values that are foreign and perhaps alien to Asian Pacific Americans, who believe in group identity, interdependency, and consensus modes of decision making (C. H. Jenkins & Kagawa-Singer, 1994). Therefore, efforts to promote more individualistic value by health care providers may create discomfort for Asian Americans because oftentimes, problems are

shared and discussed among family members (Sue & Sue, 1990). This may result in the patient's resistance to health education and treatment.

Based on the psychological theories of individual decision making, the preventive behavior model holds that the concept of health value orientation, combined with the concept of internal health locus of control, predicts preventive health behavior (Murdaugh & Verran, 1987). According to Murdaugh and Verran, health value orientation, as determined by perceived barriers and benefits, is the importance paid to health by the individual and the standard on which health choices are made; health internal locus of control is the belief that health is determined by one's actions and rational choice. The design and the implementation of cancer awareness and education activities in the United States are based on the concept that the patient's ability to control cancer is enhanced by engaging in cancer-screening activities (World Health Organization, 2002). However, as Spector (1991) pointed out, the Western belief that health is determined by one's efforts is contrary to Taoism, which believes that health is a state of spiritual and physical harmony with nature. Taoism teaches harmony between human beings and nature, and is concerned with the metaphysical and mystical process of Tao, or the Way (Ino & Glicken, 1999).

The person follows the principle of Wu-wei, or nonaction, which means that one should always act in accordance with nature, not against it. Taoism promotes the belief that nature has the ultimate authority over the course of one's life and existence (Ino & Glicken, 1999) and that one is not in complete control of nature or of one's destiny. This fatalistic view was reflected in a Chinese woman's comment in a previous cancer study:

"I do not need to know about preventive health behaviours now because future things are for the future; people do not need to worry about them now because we never know what will be happening in the future" (as cited in Hoeman et al., 1996, p. 526).

Holism is another important concept in traditional Chinese culture that affects the prevention and treatment of diseases. Chinese tend to view health holistically, where the ultimate goal is to harmonize with nature (Y. D. Chen, 1996). According to Spector (1991), the holistic concept has two major components. First, the human body is regarded as an organism. Local pathological changes such as diseases always are considered in conjunction with other organs and tissues of the entire body, rather than being considered alone. In addition, special attention is paid to the integration of the human body as an internal organism with the external environment. Spector suggested that the onset and development of disease are considered in conjunction with social and environmental changes in the person's life.

Based on this holistic concept, traditional Chinese believe that diseases such as cancer are preventable or controllable only by maintaining balanced energy levels and eating properly (Hoeman et al., 1996). Chinese immigrants accept some health measures, such as herbal remedies, acupuncture, and other traditional medical treatments, in order to strengthen the body, resist disease, and improve health and physical well-being (Ma, 1999; Spector, 1991). For many immigrant Chinese, Western diagnostic procedures are not used for screening purposes, but for a health problem only; therefore, they cannot understand why so many diagnostic tests are necessary (Spector, 1991). Chinese immigrants who have no experience with preventive care may not comprehend the

concept of screening for a disease that they probably do not have. Therefore, despite the fact that they follow some recommended health practices, they may not necessarily accept the Western approach to cancer prevention.

Cancer has a negative connotation in the Asian American community (C. H. Jenkins & Kagawa-Singer, 1994; Sun, Wong-Kim, Stearman, & Chow, 2005). Beliefs about the causes of cancer may determine what interventions are preferred and considered appropriate for cancer treatment. In more traditional Asian families, cancer is believed to be caused primarily by hereditary defects. This belief can cause the offspring in families with a cancer history to be viewed as less desirable or marriageable (C. H. Jenkins & Kagawa-Singer, 1994). Others may believe that cancer is a punishment for transgressions in this life or in past lives. These beliefs may cause Asian immigrants who suspect cancer themselves to delay seeking diagnosis and treatment from a physician (C. H. Jenkins & Kagawa-Singer, 1994). Even after they are diagnosed, they also are less likely to be compliant with treatment recommendations. Beliefs that cancer is a form of retribution for past transgressions may make traditional Chinese families reluctant to admit openly that they have cancer and to seek treatment promptly. This reluctance may explain why Chinese and Vietnamese women often are diagnosed with late-stage cancer of the cervix and breast (C. H. Jenkins & Kagawa-Singer, 1994).

Language Barriers to Cancer Education and Screening

Jang, Lee, and Woo (1998) studied health-related needs among low-income residents of San Francisco's Chinatown and concluded that limited English skills are a significant barrier to the access and use of health care services. In another study, Ma

(2000) interviewed Chinese immigrants living in metropolitan Houston and found acculturation to be associated with access to and utilization of health services. Analyzing data from the California Health Interview Survey, McCracken, Olsen, and Chen (2007) suggested that limited English proficiency may contribute to low cancer screening rates among Asian Americans. M. S. Chen (2005) also reported that Chinese, Koreans, Cambodians, and Vietnamese with limited English proficiency have proportionally fewer mammograms than all other racial groups.

Furthermore, Schiffman et al. (1991) found that cancer control educational materials are not disseminated effectively to the medically underserved immigrant populations that comprise a large number of low-literate adults. A review of studies on relationships between health literacy and health care experience also found that patients with low reading ability have difficulty not only accessing the health care system but also understanding instructions and recommended regimens. The required reading levels for many educational pamphlets on prevention, detection, and treatment of breast cancer ranged from Grade 9 to Grade 12 (Michielutte, Alciati, & Arculli, 1999). Many printed health education materials are inaccessible to those who are illiterate and to those who read at or below the Grade 4 level. Although low literacy among American adults could result from a lack of education, reading or comprehension problems, or specific learning disabilities, low literacy among Chinese immigrant groups also is often related to reading and comprehension difficulties associated with learning English as a second language (Michielutte et al., 1999). Chinese women who have a Grade 8 education or less, or who

do not speak English fluently, are less likely to ever have had mammograms than their counterparts who are more educated or who speak English more fluently (CDC, 1992).

Lee, Lee, and Stewart (1996) confirmed that the ability to speak English well is significantly associated with breast and cervical cancer screening knowledge and practices. Therefore, it is important for health care providers to be aware of the low health literacy status of their patients and to explain information clearly so that patients can understand it (Lam, Cheng, & Chan, 2004). Furthermore, public health providers should have a commitment to provide cancer control programs that are culturally and linguistically sensitive to the intended population (M. S. Chen, 2005; McCracken et al., 2007). Liang et al. (2004) and Schneider (2006) commented that screening recommendations delivered in manners that are linguistically sensitive and respect the women's cultural background and value on health are more likely to motivate women to adhere to the recommendations in spite of the inconvenience in the health care system.

Diffusion of Innovation Theory and Breast Cancer Early Detection

The diffusion of innovation theory (Rogers, 2002) was the underlying theoretical framework for this study. This theory explains how the adoption of an innovation spreads through a social system. As discussed in chapter 1, this process involves four primary elements: (a) an innovation, which is an idea, practice or object considered new for potential adopters; (b) communication channels, or the means by which messages are transferred from one individual or group to another; (c) the time that it takes to adopt the innovation; and (d) the social system, which is a set of interrelated units engaged in achieving a common goal.

Perceptions about the five characteristics of the diffusion of innovation theory (Rogers, 1962) affect decision making about adoption and the adoption rate. Relative advantage means that the innovation is viewed as providing greater benefit or advantage than traditional practice. Compatibility is the degree to which the innovation is consistent with the potential users' existing values, previous experiences, and needs. Complexity represents the level of difficulty in understanding the innovation and its ease of use: Simplicity and flexibility encourage adoption (Davies & Macdowall, 2006). Trialability refers to the degree to which the innovation can be tested before permanent adoption. Observability is the extent to which the results of adopting the innovation, both benefits and risks, can be observed.

The change agent, or champion, who promotes the adoption of an innovation is another critical factor affecting success (Rogers, 2002). This change agent may be an internal member of the social system or an external individual or group working with the population. The appropriate selection of the change agent can help to accelerate the rate at which the innovation is adopted.

Rogers (2002) also identified five categories of people in the social system who adopt an innovation at different rates. Innovators, early adopters, and the early majority are individuals who are amenable to change and have some personal, social, or financial resources to adopt the innovation. Late adopters and laggards are skeptical, cautious, and economically limited (Davies & Macdowall, 2006). Davies and Macdowall further indicated that the characteristics associated with successful adoption of an innovation are related to the socioeconomic status and cultural values of the adopters.

The diffusion of innovation theory has been widely applied to a broad variety of issues by such disciplines as health education, sociology, communication, and marketing (Rogers, 1995). Several studies have used this theory as a framework for research on cancer control in Asian American communities. One such study (Ma, Fleisher, Gonzalez, & Edward, 2004) targeted a customized radio campaign on smoking and health, cervical and breast cancer, clinical trials, and other cancer information to four Asian ethnic groups: Chinese, Korean, Vietnamese, and Cambodian. The campaign for each group was carefully designed to reflect its attitudes, cultural values, and language. The results showed that the campaign had a positive impact on cancer awareness in each group. Ma et al. attributed this success to Rogers's diffusion of innovation model. According to Rogers, the adoption of an innovation is the most likely to take place if the adopters' attitudes and cultural values are considered and if the barriers hindering adoption are addressed.

Levy-Storms and Wallace (2003) also provided empirical support for using the diffusion of innovation model (Rogers, 1995) to guide their study on mammography screening among older Samoan women in Los Angeles County. The purpose of the study was to explore how interpersonal networks and use of change agents (i.e., lay peers from churches) could influence the use of mammography screening among the study sample. The researchers surveyed 260 Samoan women ages 50 or older from 39 randomly sampled Samoan churches in Los Angeles County between 1996 and 1997. The results of the study suggested that the women who were the most well connected with lay peers

from their respective churches were also the most likely to have a recent mammography screening.

Another example of the adoption of a health education program by using the diffusion of innovation theory approach was reported in a study focusing on a worksite AIDS program (Backer & Rogers, 1998). In the study, the researchers described how the innovation, the worksite AIDS program, diffused into and was adopted by the employees. One important component of this study was to examine the role of a champion, who was essential in helping to spread the availability of the innovation, so that other employees would utilize the services. The theory also was used in advocating for health policies and programs, as described in a study by Howze and Redman (1992).

In summary, the diffusion of innovation theory (Rogers, 1995) is useful in providing guidance on how parents can learn breast cancer screening guidelines by watching their children perform these guidelines. The five significant innovation characteristics of relative advantage, compatibility, complexity, trialability, and observability were used to guide and tailor the performance. This theoretical framework set the parameters to deliver breast health guidelines to the Chinese immigrant community. This theoretical framework also was used to determine the responses from the community and how the community accepted or rejected this innovation of the practice of recommended breast health guidelines.

Influence of Children on Parents

This section of the chapter reviews studies on children's influence on parental behavior. Several studies have been conducted on the influence of children on their

parents' political and sociocultural beliefs and purchasing decision making, and a few on their influence on health care attitudes and behaviors. However, because of the scarcity of empirical investigations on the influence of preschool-age (i.e., 3-5 years) children on their parents' attitudes and behavior changes, the review was primarily on older children's influence on parental attitudes and behavior changes, especially those related to health.

A few investigators (Bhore et al., 1992; Jacob et al., 1994) have embarked on empirical studies to determine how young children can positively influence their parents' knowledge of health and health practices related to preventive care. Some researchers (Brown & Ogden, 2004; Johannsen, Johannsen, & Specker, 2006; Okada et al., 2002) have investigated parental influence on children's health practices and behaviors. Evans, Clark, Levison, Levin, and Mellins (2001) indicated that traditionally, the caregiver, generally the mother, is expected to assume the primary responsibility for changing behaviors of the children and other family members through education and role modeling.

Bottom-Up Approach

Scholars have provided some evidence of children's influence on parents' political attitudes and general media use. Hagestad (1977) reported that one third of the mothers who were interviewed commented that their opinions on political issues had been influenced by their children. Angres (1975) concluded that the mothers of radical college students changed their attitudes about cohabitation based on their children's behavior. Meanwhile, research on family media use occasionally has pointed to the active

role of the children. Bottorff (1970) found that more parents asked their children for advice on television programs than children asked parents. Chaffee, Ward, and Tipton (1970) reported that two thirds of the respondents in their study felt that their parents sometimes watched television programs because the children watched them.

Business marketing analysts recognize the value of the bottom-up approach, for example, by marketing food designed to target children during the Saturday morning children's popular television programs (Grier, Mensinger, Huang, Kumanyika, & Stettler, 2007). Therefore, as evidenced by bottom-up marketing strategies, children influence their parents on the types of foods their parents purchase. Robinson, Borzcekowski, Matheson, and Kraemer (2007) reported that the food and beverage industry spends more than $10 billion annually on marketing products to children. In their study of 63 preschoolers ages 3 to 5, about one third of the parents reported buying their children food from McDonald's more than once a week. Other researchers (Flurry, 2007; Meyers, 2004; Roy, 2004; Turner, Kelly, & McKenna, 2006) have reported that children are influential in their parents' decision making related to the purchase of household items and family food choices.

Top-Down Approach

A top-down approach to family influence is evident in the characterization of distinct roles for the husband, wife, and child. Writing in 1971, Jennings and Niemi remarked that conventional wisdom

> Sees politics as a man's world, and this view is supported by evidence of greater male participation at the mass level and preponderant occupancy of political positions at the elite level. These findings, when transferred to the family context,

> implicitly support the notion that the husbands are the dominant figures when inequities do exist among couples. (p. 70)

However, as Lau, Quadrel, and Hartman (1990) suggested, the prevailing top-down view of parent-child influence has failed to acknowledge the capacity of the developing child to stimulate parental interest in politics.

Reciprocal Influence

Although a reciprocal interaction approach has been applied to parent-child relationships, this view has not taken firm hold within the literature of family-based political socialization (H. Wilson, 1983); however, in the few studies that have incorporated a reciprocal approach, adolescent influence on parents was measured as the ability to change the direction of a parent's opinion. McLeod and O'Keefe (1972) suggested that the reciprocal influence results from socialization taking place primarily through interpersonal rather than intrapersonal variables. They argued that the socializer and the socializee are socialized through interaction, and they defined the unit of analysis as the some-receiver combination. This approach facilitates the modeling of a cyclical process in which intrapersonal outcomes have effects on subsequent interpersonal interaction, which then affects intrapersonal individual dimensions. McLeod and O'Keefe argued that dependent variables can be operationalized in terms of similarity of the socializee's and the agent's behaviors or in terms of the absolute level of the socializee's behavior. The final type of outcome is usually documented as evidence of direct influence, whereby the socializee adopts through modeling or imitation the behavior of the agent.

Involving Children to Deliver Health-Related Messages

Although no empirical studies have investigated the efficacy of utilizing young children's theatrical performances to influence their parents and relatives attitudes and behaviors related to health, Teyber, Messe, and Stollak (1977) found in their study of adults' responses to children's communication that the adults exhibited a strong tendency to respond to their children's messages if they were delivered in a loving tone. Rosselli, Skelly, and Mackie (1995) suggested that emotional appeals could generate attitude change through the cognitive and affective mediation of persuasion. Pernick (1978) commented that in the early 1900s, many health promotion efforts were targeted at children because it was believed that children were more amenable to persuasion and that they would influence their parents more than outsiders could. For example, the Modern Health Crusade organized by the National Tuberculosis Association in 1922 to deliver educational messages on tuberculosis involved a nationwide organization of millions of schoolchildren.

The findings from empirical investigations have supported the efficacy of involving young children in health promotion. For example, studies in India have demonstrated that children's knowledge about leprosy influenced their parents' attitude toward leprosy (Bhore et al., 1992; Jacob et al., 1994). In a more recent study, Kozlowska-Wojciechowska et al. (2002) found that children's knowledge about nutrition can affect their parents' dietary behaviors. In 1994, Ng, a pediatrician, who worked in the San Francisco Chinatown community, engaged Chinese children to encourage their parents to stop smoking by simply including the children's signature (or palm prints of

infants) on prescriptions he wrote to the parents urging them to quit smoking. Ng observed that approximately 50 parents stopped smoking as a result of this intervention. Contento (1995) reported that a nutrition intervention program at the preschool level demonstrated an improvement in the parents' behavior related to food choices for their children.

There have been numerous studies involving older children to improve the knowledge and practices of their parents related to health (Ballantyne, Fien, & Packer, 2001; Crockett, Mullis, & Perry, 1988; Xia et al., 2004). Vaughan, Gack, Solorazano, and Ray (1999) involved students in Grades 3 and 4 who were learning about conservation principles in a school environment and transferring the knowledge to their parents. The results of the study showed a high level of information transfer from the children to their parents concerning conservation of the environment. Another study by Hyland, Stacy, Adamson, and Moynihan (2005) among 12- and 13-year-old children in low-income areas in northeast England suggested that the children could be a conduit of influence on their families' attitudes and behaviors toward food choices.

The findings from a study involving nutrition education of children ages 6 to 12 indicated not only that the children improved their knowledge of nutrition and food choices but also that they acted as conduits to influence other family members' dietary habits (Basedevant, Boute, & Borys, 1999). In a study of students with asthma in Grades 3 to 5, Evans et al. (2001) found that the children could positively influence their parents' self-management of asthma. Other researchers (Bessell, Deese, & Medina, 2007; Wang & Pies, 2004; N. Wilson et al., 2007) who have conducted studies with older children

ages 9 and older have used Photovoice, a participatory action research methodology, to convey their messages to policymakers, evaluators, and educators. In Wang and Pies's study, they had the children utilize Photovoice as a means of conducting a needs assessment for the California Maternal and Child Health Agency.

The Use of Drama in Delivering Health Messages

Researchers (Cheney, Kohler, & Muilenburg, 2006; Cueva, Kuhnley, Lanier, & Dignan, 2003; Stephens-Hernandez et al., 2007) have investigated the value of using drama to deliver health messages. However, there has been a lack of empirical investigation on the efficacy of involving young children to deliver breast cancer early detection programs through theatrical performance. Empirical support for the use of drama in health education has been inconclusive. Cheney et al. (2006) evaluated the use of drama in breast cancer education promotion. The drama, which was a one-woman play, was performed by a local African American actress at an African American community center in Alabama. The play was approximately 1.5 hours long and had four scenes. Following each scene, a question-and-answer session was conducted between the audience and a panel of cancer care providers and cancer survivors. A total of 266 men, women, and children attended the drama. However, only the female participants were invited to complete the pre- and posttests. The survey covered topics on knowledge, attitudes, and beliefs related to breast cancer. Although all of the females who completed the tests agreed that the play was a good way to educate females about breast cancer, Cheney et al. suggested that the play had limited impact with regard to mammography screening knowledge, attitudes, and intention of getting a mammogram.

Stephens-Hernandez et al. (2007) provided empirical support for the use of drama in substance abuse education and prevention. The study involved adults in the drama to educate and motivate the targeted audience in substance abuse prevention. The purpose of the study was to raise awareness and understanding of the risk factors associated with alcohol and drug abuse. The researchers hypothesized that the drama-based education program would change attitudes toward alcohol and substance abuse and increase participation in local substance abuse prevention activities. The drama incorporated a component of emotional response to the informational content. Stephens-Hernandez et al. concluded that the drama was an effective mechanism to increase the targeted audience's knowledge of issues related to substance abuse and their intent to participate in substance abuse prevention activities in the community.

Cueva et al. (2003) supported the use of drama in delivering health messages. The purpose of their study was to promote cancer education among Alaska natives using drama-based education. The play was based on Alaska natives' tradition of sharing information through story telling. It included stories shared by local cancer patients. Many sensitive and difficult topics, such as emotions associated with a cancer diagnosis, treatment concerns, pain management, and loss and grief, were depicted through the play. Performances took place in villages, bingo halls, urban settings, and classrooms. After each performance, a postplay discussion was provided for the attendees to share their stories and thoughts and to ask questions. Eighty-five percent of the 488 study participants indicated that the play had created a comfortable, supportive environment to share issues on cancer. Cueva et al. concluded that the play was an effective means to

share cancer information and increase knowledge and understanding of cancer among the targeted audience.

Summary

This chapter thoroughly examined many cross-cultural studies that have investigated ethnic differences regarding the meaning of cancer, illness-coping strategies, and attitudes toward death and dying. Based on the cultural attitudes and beliefs about cancer, breast cancer is still considered a death sentence in many minority communities. The literature reviews focused on the Chinese culture, which values community and a holistic orientation to well-being. This orientation contradicts the Western health model, which focuses on individual health, thus creating difficulties and resistance in individuals to take responsibility for maintaining health and complying with cancer detection guidelines.

The diffusion of innovation theory (Rogers, 1995) was used as a theoretical framework for the study, and its relation to cancer education and other health topics was discussed. Breast cancer guidelines are considered an innovation by Chinese immigrants, and the application of the theory helps to explain how the intervention can be considered valuable for early breast cancer detection. The chapter concluded by reviewing several studies that investigate the effectiveness of utilizing children to deliver health messages to parents and drama to convey health information. The next chapter describes the methodology, sampling procedures and criteria, demographics of the sample, intervention used, instrument selection, and the data collection process and analysis.

CHAPTER 3: RESEARCH METHOD

Introduction

This chapter describes in detail the research design and approach, setting and sample, intervention, instrumentation and materials, data collection methods, the secondary data analysis, and the procedures that were taken to protect the participants' rights.

Statement of the Problem

This study addressed the problem of late-stage breast cancer diagnosis in the Chinese immigrant community (ACS, 2006). Although many factors contribute to a late diagnosis, this study focused on the unmet need for a culturally competent breast health education program that addresses cultural beliefs and the barriers to early breast cancer detection. The study addressed this problem by testing the efficacy of the theatrical preschool performance in young children's influence on adults' attitude toward their practices related to the early detection of breast cancer.

Purpose of the Study

The purpose of the study was to test whether a culturally and linguistically competent cancer control program, guided by the diffusion of innovation theory (Rogers, 1962) can raise the awareness among Chinese immigrant women about the breast health guidelines published by the Susan G. Komen for the Cure (2008).

Research Design and Approach

1. Did a theatrical preschool performance increase the study participants' knowledge of breast cancer screening guidelines?

2. Were acculturation and attentiveness to the performance associated with the study participants' knowledge gain?

H_{01}: After watching the theatrical preschool performance, the participants will not score higher on knowledge of the Susan G. Komen for the Cure's breast health guidelines at posttest than at pretest.

H_{a1}: After watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest.

H_{02}: The participants' knowledge score at posttest will not be positively associated with self-reported acculturation and attentiveness to the theatrical performance.

H_{a2}: The participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance.

The original study upon which this secondary analysis was based employed a quantitative quasi-experimental approach utilizing a survey questionnaire with pre- and posttest questions related to the breast health guidelines published by the Susan G. Komen for the Cure (2008). Pre- and posttests are useful tools for measuring program outcomes and success (Trochim, 2001). The differences between a pretest and a posttest should reflect the learning or attitude changes that occur because of the program's content. A pretest and a posttest are commonly used in behavioral research to measure

changes resulted from a particular intervention and evaluate the impact of the intervention (Dimitrov & Rumrill, 2003).

Although there were several study designs, described later in this chapter, that the original study could have employed, the utilization of young children's theatrical performance was the most innovative approach to reach Chinese immigrant women because Chinese parents and grandparents usually make more of an effort to attend school functions, especially those involving young children. As Teyber et al. (1977) suggested, adults respond favorably to children's messages when they are delivered in a loving tone. Moreover, as mentioned previously, studies have confirmed that young children can be an effective change agent in influencing parents' knowledge of leprosy (Bhore et al., 1992; Jacob et al., 1994) and dietary behaviors (Kozlowska-Wojciechowska et al., 2002).

The research team could have employed at least three possible study designs instead of choosing to deliver the breast health messages through young children's theatrical performance only. The first possible design was to include a control group in the original study. In the control group, the breast health messages could have been delivered to a randomly selected group of participants through a traditional seminar format. The difference in knowledge scores from pre- to posttest between both groups could have been compared to determine the efficacy between the children's theatrical performance and the group seminar format. However, because the study was a pilot project, and because of budgetary constraints, the research team was not able to include a control group in the original study design.

The second possible research design that the research team could have utilized was to divide the participants into two randomly selected groups: One group received the breast health messages in printed format, and the other group was given the messages in a seminar setting. Again, the difference in knowledge scores from pre- to posttest between both groups could have been compared to determine the efficacy of each intervention format.

The third possible research design was to use video and printed materials to convey the breast health messages. All of the participants could have been assigned randomly to two groups, namely, one that received the breast health messages through an educational video, and one that received them through a printed brochure. The difference in knowledge scores from pre- to posttest between both groups could have been compared to determine the efficacy of each venue of message deliveries.

Setting and Sample

Recruitment of the Sample

The project that provided the descriptive data for the current secondary analysis was intended to target Chinese immigrant women who are the most comfortable receiving information in their primary language and cultural setting. The participants in the study were recruited from female audience members who viewed theatrical performances at four preschools. These preschools were selected for the project because the majority of their students were from Chinese immigrant families and the school principals gave permission for the study to be conducted in their schools.

Sample Size

If the random variables were considered to be of a Bernoulli distribution, the test statistics would asymptotically converge to a normal distribution. Under the null hypotheses, it was equivalent to assume a Bernoulli distribution with a probability of .5. It required fewer than 10^2 samples to make the empirical distribution reasonably close to a normal distribution. Hence, the results drawn from a survey of 177 participants were fairly reliable.

Sampling Method

The study utilized a convenience sample of 177 female audience members who viewed the preschool theatrical performances. In general, the probability or random sampling method is preferable among researchers because of its accuracy and empirical rigorousness. However, in public health research, there may be situations where it is not feasible or practical to conduct random sampling (Trochim, 2001). For example, it was not feasible and sensible to employ a random sampling method for this study because of budgetary constraints and the stigma associated with cancer within the Chinese immigrant community. Although it is difficult to draw a general conclusion from a convenience sample, the results that were generated could provide researchers with findings on the efficacy of cultural competency in delivering cancer control messages. In addition, the findings will provide preliminary data for further investigation.

Eligibility Criteria

The sample inclusion criteria were all Chinese American female audience members who were 18 and older and able to read English or Chinese. The exclusion

criteria were participants who were male, non-Chinese American, unable to read English or Chinese, and under 18 years of age.

Demographic Characteristics of the Sample

The ages of the selected participants ranged from 25 to 77. The length of stay in the United States ranged from less than 1 year to 68 years. Approximately 23% of the participants had less than a high school education, and slightly over 50% had completed college or higher education, either in their country of origin or in the United States. About 43% had an annual household income of less than $30,000. Over 80% of the participants were related to the preschoolers as mothers and grandmothers.

Description of the Intervention

In 2005, a community-based health resource center, in collaboration with four San Francisco preschools that serve the Chinese immigrant community, conducted preschool theatrical performances to raise awareness among Chinese immigrant women of the breast health guidelines published by the Susan G. Komen for the Cure (2008), a national institute focusing on breast health. The entire preschool theatrical performance took approximately 20 minutes and was divided into three segments: (a) The selected preschoolers walked across the stage holding foam boards printed with individual breast health guidelines from the Susan G. Komen for the Cure written in Chinese and English; (b) The preschoolers sang a popular Chinese children's song, "Mommy Is the Best Person in the World," in a group setting while holding the foam boards; and (c) the preschoolers came together in a group once again, saying to the audience, "Mommy,

Grandma, and aunties, we love you. Please take good care of yourself." Over 90% of the preschoolers were from Chinese immigrant families.

It took seven foam boards to display all of the breast health guidelines. Each foam board measured 16.5" x 23.4"; the breast health guidelines were printed on white paper pasted on the board. Three guidelines were listed: (a) Practice BSE monthly if you are age 20 or older; (b) have a mammogram annually if you are age 40 or older; (c) have a breast exam performed by a health care provider every 3 years if you are age 20 to 39, and annually if you are age 40 or older. Because of the content of the guidelines, it took two foam boards to display the guideline on BSE, three boards to exhibit the guideline on CBE, and two boards to show the guideline related to screening mammography. Each child held one foam board, and all the children with the foam boards stood in the first row.

Prior to development of the messages and the signs, the research team consulted with local clinicians who specialized in childhood development to ensure that they were appropriate for preschoolers to understand and convey to adults. In addition, the accuracy of the message was verified by an experienced public health specialist. Before the performance, the research team worked with the preschool teachers to coach the selected preschoolers for the performance. The coaching included how to sing the song, how to hold the foam boards while walking across the stage, and what to say to the audience after singing the song. Young children were involved as change agents in the performance to promote breast health guidelines awareness among Chinese immigrant women.

Instrument and Materials

The pretest survey consisted of 10 items. Six items were designed to assess the participants' knowledge of breast health guidelines published by the Susan G. Komen for the Cure (2008), with three correct breast health guidelines mixed with three incorrect guidelines. The participants were asked to identify the correct guidelines from a list of multiple choices. Three items asked about the participants' current practices related to the recommended breast health guidelines. The participants were asked to recall the frequency of performing BSE and getting a mammogram and CBE through a list of given choices that included those consistent and inconsistent with the Komen guidelines. The participants were asked to give the date of the screenings if they had only had the screenings once in their lifetime. The last item asked about the participants' current ages.

The posttest survey comprised 21 items. The items about breast health guidelines were asked again. The remaining items were unique to the posttest. To assess the participants' intention to carry out the recommended breast health guidelines, they were asked whether they intended to follow each of the guidelines by responding yes or no. To identify the participants' relationship to the preschoolers, one item was included for them to describe their relationships to the preschoolers through a group of choices. To measure the participants' attentiveness to the theatrical performance, and to determine whether the performance would influence their plan to adhere to the recommended guidelines, two items were included in the questionnaire. The participants were asked, through a given list of choices, to describe whether the theatrical performance would influence their plans about breast health screening and their attentiveness to the health message delivered. The

last 8 items were formulated to solicit information related to acculturation and demographics. The demographic questions included items on country of origin, age, level of education, annual household income, health insurance status, and ethnicity. For the purpose of the secondary data analysis study, the 4 items aimed to assess the participants' intention to carry out the recommended breast health guidelines were not included in the analysis.

Reliability and Validity of the Instruments

The reliability of the instruments was assessed by test-retest reliability and internal consistency. Test-retest reliability is a measure of whether the responses to an item are consistent when the test is repeated. Because the intervention was designed to increase knowledge of breast health guidelines, the test conditions for the pre- and postperformance questionnaires were not identical. Test-retest reliability of the health guidelines was not appropriate. The one item that was repeated across the two measurements and should not have been affected by the intervention was a question regarding the participants' ages. The agreement between the ages obtained at pre- and postquestionnaire administrations, as measured by correlation coefficient, was the only available measure to be used as a proxy of the test-retest reliability of the entire instrument.

Internal Consistency

The primary outcome measure of the study was the knowledge of correct breast health guidelines, as measured by the six items consisting of three correct and three incorrect guidelines. Internal consistency measured by KR-20 for true-false items was

computed for the six knowledge items. The questionnaire contained pairs of items, one accurate and one inaccurate, for each breast health guideline. It was expected that endorsement of the accurate and inaccurate items for each guideline pair would be negatively correlated and that endorsement of the accurate guidelines would be positively correlated.

To establish the face and content validity of the questionnaire items, prior to administering the pre- and postsurveys, the questionnaires were reviewed by an external research consultant to ensure that each item was constructed and presented in a reasonable way to obtain the information intended by the study. The content validity of the six items designed to assess the participants' knowledge on the breast health guidelines was established by the verification of the accuracy of the items from a representative of Susan G. Komen for the Cure who was unaffiliated with the research group. The questionnaires were then translated into Chinese, and each item was reviewed and discussed by a focus group consisting of eight native Chinese speakers for readability and face validity testing. The final items in the questionnaires were considered to have the anticipated face validity in obtaining the information from each domain that the study was intended to measure. In addition to establishing the face and content validity of the instruments, based on the data collected, the construct validity and the criterion validity of the knowledge items were examined.

Construct Validity

Previous studies on individual factors associated with knowledge of breast health guidelines have consistently shown that females with higher education tend to be more

knowledgeable of breast health (ACS, 2008a; Parsa et al., 2006; Sun, Zhang, Tsoh, Wong-Kim, & Chow, 2007; Tu et al., 2003). Education also has been positively related to knowledge in various health areas (Lindau et al., 2002; Nutbeam, 2000; Stone, 1986; Williams, Baker, Parker, & Nurss, 1998; Winkleby, Jatulis, Frank, & Fortmann, 1992). Therefore, based on the data collected in this study, the construct validity, as reflected by the convergent validity of the knowledge measure, was assessed by the correlation between the number of correct breast health guidelines identified at pretest and the level of education self-reported by the participants. A significant positive correlation between pretest knowledge and education indicated acceptable convergent validity of the knowledge measure.

Criterion Validity

Knowledge and behaviors have been shown to be closely related (Bandura, 1977, 2004; Bettinghaus, 1986; Kolbe, Vamos, Fergusson, Elkind, & Garrett, 1996; Powell, Hill, & Clancy, 2007; Rimal, 2000; Yu, Chen, Kim, & Abdulrahim, 2002). To test the criterion validity of the knowledge items based on the data that were collected, the association between the correct identification of each guideline at pretest and the corresponding behavior were used as an assessment of the criterion validity. An acceptable criterion validity of the BSE knowledge item was indicated by statistically significant chi-square statistics ($p < .05$) showing that the participants who correctly identified the BSE guideline at pretest would be more likely to report performing BSE once a month or more frequently at pretest. Similarly, an acceptable criterion validity of the CBE knowledge item was indicated by statistically significant chi-square statistics

($p < .05$) showing that the participants who correctly identified the CBE guideline at pretest would be more likely to report having had a CBE with in the past 2 years. An acceptable criterion validity of the mammography item was indicated by statistically significant chi-square statistics ($p < .05$) showing that among the participants over the age of 40, those who correctly identified the mammography guideline at pretest would be more likely to report having had a mammogram done within the past 2 years.

Data Collection and Analysis

Immediately before and after each performance, all female audience members who met the inclusion criteria were asked to complete the self-administered pre- and posttests in the language of their preference, either English or Chinese. Prior to the administration of the pretest, all participants who agreed to take part in the study signed the consent form in the language of their choice. Ninety percent of the surveys were completed in Chinese, and 10% were completed in English. The refusal rate for participation was 10%. Trained research assistants were available to help those individuals who had questions about the study or the questionnaires. A total of 167 women completed the pre- and postsurveys. The pre- and postsurveys were matched utilizing a number system. All those participants who completed the presurvey also filled out the postsurvey. The pretest consisted of 10 items, and the posttest contained 21 possible items.

All the secondary data analyses were conducted using SPSS 15.0. Frequency distributions of each variable were examined for outliers or unexpected response patterns. Descriptive analyses (means, standard deviations, proportions, and confidence) were used

to summarize the characteristics of the sample. Test-retest reliability based on the correlation coefficient of the ages obtained at pre- and postquestionnaire was computed. The internal consistency using KR-20 was computed for the six knowledge items. Convergent validity of the knowledge score (i.e., number of correct guidelines identified) was computed using the correlation between the prequestionnaire knowledge score and the level of education reported. In addition, three chi-square tests were conducted to examine the criterion validity of each correct guideline identified at pretest for BSE, CBE, and mammography, with their corresponding self-reported breast health practice, as described in the Reliability and Validity of the Instruments section.

H_{a1}: After watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest. The participants were asked to select the correct guidelines at pre- and posttest. A knowledge score was measured by the number of correct guidelines selected. The knowledge score ranged from 0 to 3, with 3 being the maximum number of correct guidelines that could be selected. To test H_{a1}, the researcher conducted a dependent *t* test to compare the knowledge scores obtained at pre- and posttest. Alpha was set at 0.05.

H_{a2}: The participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance. A knowledge score was computed for each guideline item, as described in H_{a1}. The total knowledge increased score ranged from 0 to 3. A total knowledge score of 1 was considered an increase in knowledge. Attentiveness was

measured by a single item asking a participant to describe, through a Likert-like scale of choices, her degree of attentiveness to the health message delivered. Potential confounding characteristics included the following: demographic variables (age, marital status, education, health insurance status and annual household income); acculturation (measured by birthplace and length of stay in the United States); and the participants' relationship to the child or children who took part in the performance. Standard linear regression was used to assess the relationship among attentiveness, potential confounding variables, and changes in the total knowledge score. Bivariate logistic regression also was used to examine the relationship between characteristics of audience members and any increase in knowledge. Significance of independent variables was determined by a two-sided *p* value of .05 or less.

Protection of Participants' Rights

The study was approved by a local hospital's IRB. Walden University's IRB (approval #02-16-0292091) also approved this secondary data analysis study. Prior to the theatrical performance, the research team worked with the principals of the preschools to obtain the parents' consent for their children to participate in the performance. Because of the stigma associated with cancer and modesty about discussions related to breasts and breast health, the nature of the theatrical performance was clearly indicated in the consent form. All parents signed the consent form. Immediately before administering the presurvey to the participants in the audiences of the theatrical performances, the eligible participants were asked to sign an informed consent in the language of their preference, English or Chinese. The consent form included information about the purpose of the

study, organizations involved, funding sources, data collection method, approximate time needed to complete the surveys, risk involved, privacy and confidential issues, data access, dissemination of the results, voluntary participation, freedom to withdraw from the study at any time, and the researcher's contact information to address any questions or concerns about the study. For participants who had difficulty reading the forms, trained research assistants explained the content of the consent form prior to their signing the form.

Summary

Chapter 3 discussed the methodology used to study the research questions. It described the original study and the process of administering the pre- and posttheatrical performance questionnaires. It also provided a detailed description on the sample population and sampling procedures, eligibility criteria for the study, characteristics of the sample, intervention used, instrument and material, reliability and validity of the instrument, data collection, and analysis and ethical considerations. Chapter 4 presents the details of this secondary data analysis in answering the research questions. It also explains the results of the study.

CHAPTER 4: RESULTS

Introduction

This chapter includes the results of a secondary data analysis of 177 pre-and postperformance surveys collected from four San Francisco preschools. All female members of the performance audience who were eligible to participate in the study were asked to complete a pre- and postperformance survey. Secondary data analyses were conducted based on the responses to the survey items regarding the participants' knowledge and practices related to breast health guidelines, self-reported attentiveness to performance, relationship to the preschoolers participating in the performance, and demographics. Standard linear regression analyses, *F* tests, bivariate logistic regression, and nonparametric tests were performed to address the following research questions and hypotheses:

1. Did a theatrical preschool performance increase the study participants' knowledge of breast cancer screening guidelines?
2. Were acculturation and attentiveness to the performance associated with the study participants' knowledge gain?

H_{01}: After watching the theatrical preschool performance, the participants will not score higher on knowledge of the Susan G. Komen for the Cure's breast health guidelines at posttest than at pretest.

H_{02}: The participants' knowledge score at posttest will not be positively associated with self-reported acculturation and attentiveness to the theatrical performance

H_{a1}: After watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest.

H_{a2}: The participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance.

The sample comprised 167 participants because 10 of the 177 questionnaires had some unanswered questions and were consequently not included in the analysis. However, those 10 discarded questionnaires were included in the final data analysis because the response patterns suggested that the participants had left those questions blank by choice. Thus, the final number of questionnaires included in the data analysis was 177.

Demographics

The ages of the participants ranged from 25 to 77; the mean age was 40.1. The majority of participants were born outside of the United States, with 53.8% (93) from China and 17.9% (31) from Hong Kong, Macau, and Taiwan. Ninety-six percent (166) of the participants were married. Approximately 53% (90) of them had a high school education or less, either in the country of their origin or in the United States. About 46% (76) of the participants had an annual household income of less than $30,000. About 36% (61) of the participants had resided in the United States for more than 10 years. Over 60% (117) of the participants were the mothers of preschoolers. Approximately 15% (26) of the participants did not have health insurance. Table 1 summarizes the participants'

responses to the demographic items included in this analysis. All percentages, unless otherwise noted, were based on the number of valid responses to an item, and the number of valid responses is listed next to each variable name.

Several items asked for free-form responses; these items were manually recoded into categories. A participant's relationship to a child or children in the performance was recoded as Mothers and All Other Relationships. Birth country was recoded into four categories: United States; China; Hong Kong, Macau, and Taiwan; and Others. Years of education were recoded as Less Than a High School Diploma or Equivalent; High School, but No College Degree; and College Degree. Number of years in the United States was recoded into a dichotomous variable of more than 10 years and 10 or fewer. Approximately 46% (78) of the participants reported that they would pay much more attention if health messages were incorporated into children's performances rather than delivered through conventional channels, and 32.5% (55) reported that they would pay slightly more attention if health messages were delivered through children's performances.

Table 1

Participants' Demographics

Variable	No. of participants	Percent
Birth country		
United States	27	15.6%
Hong Kong, Macau, Taiwan	31	17.9%
China	93	53.8%
Others	22	12.7%
Total responses	173	100%
Marital status		
Single	5	2.9%
Married	166	96.0%
Divorced	0	0.0%
Widowed	2	1.2%
Total responses	173	100%
Education		
Less than high school	40	23.4%
High school	50	29.2%
College degree	81	47.4%
Total responses	171	100%
Annual household income		
Less than $30,000	76	45.5%
$30,000 - $50,000	22	13.2%
$50,001 - $80,000	16	9.6%
More than $80,000	53	31.7%
Total responses	167	100%
Mother of child	117	66.1%
Total responses	177	
Has health insurance	147	85.0%
Total responses	173	
In United States longer than 10 years	61	(36.1%)
Total responses	169	
Attentiveness to performance relative to other health messages		
Much more attentive	78	46.2%
Slightly more attentive	55	32.5%
Same	31	18.3%
Slightly less attentive	5	3.0%
Much less attentive	0	0.0%
Total responses	169	100.0%

Knowledge of Breast Health Guidelines

The participants' knowledge of nationally recommended breast health guidelines was assessed from a list of six questions administered pre- and postperformance. The participants' endorsement of the breast health guidelines at pre- and posttest is described in Table 2. Because the items were presented as a checklist, the participants were free to choose as many or as few guidelines as they wished. Although the items were presented in pairs of similar guidelines adjacent to one another, the participants could have chosen one, both, or neither of each pair of guidelines.

On the questionnaire, the breast health items were directly above several other items, and the participants who failed to endorse any guidelines did answer the other items on the questionnaire. This suggested that the participants did not ignore the guideline items. The participants who selected none of the six questionnaire items related to breast health guidelines were considered to have deliberately chosen not to endorse the items, and those items were not recoded as missing. Four participants endorsed no breast health guideline items on the pretest, and 1 participant endorsed no breast health guideline items on the posttest. Missing values for other questionnaire items were not recoded.

Table 2 indicates the participants' knowledge changes on breast health guidelines from pretest to posttest. Significant knowledge changes were observed for Questions 1, 2, 4, and 5 on both true and false guidelines of BSE, mammogram, and CBE. Approximately 36% (63) of the participants endorsed the false guideline for Question 1 at pretest, but they did not endorse the same false guideline at posttest. The knowledge

change was 16.9% (-30) and the *t* test *p* value was < .01. For Question 2, about 23% (41) of the participants endorsed the true guideline at pretest, but on the posttest, the number of participants who endorsed the true guideline more than doubled. The knowledge change was 36.2% (64), and the *p* value was < .01. No significant knowledge changes were observed for Questions 3 and 6 on the false guidelines related to mammogram and CBE. For Question 4, regarding the true guideline about annual mammogram screening, the knowledge change was almost 12% (21), and the *p* value was < .01. Finally, the knowledge change for Question 5, which was on the true CBE guideline, was 12.4% (22), and the *p* value was < .01.

Table 2

Participants' Knowledge Change of Breast Health Guidelines from Pre- to Posttest

Questionnaire item	Pretest	Percent	Posttest	Percent	Change	Percent	*p* value
Q1: BSE (False)	63	35.6%	33	18.6%	-30	-16.9%	< .01
Q2: BSE (True)	41	23.2%	105	59.3%	64	36.2%	< .01
Q3: Mammogram (False)	37	20.9%	26	14.7%	-11	-6.2%	.05
Q4: Mammogram (True)	88	49.7%	109	61.6%	21	11.9%	< .01
Q5: CBE (True)	78	44.1%	100	56.5%	22	12.4%	< .01
Q6: CBE (False)	40	22.6%	28	15.8%	-12	-6.8%	.08

The presentation of breast health guidelines in pairs of items related to three different breast health guidelines (BSEs, mammograms, and CBEs) led to complexity in interpreting the participants' knowledge of the guidelines. Although endorsement of a true guideline suggested knowledge of that guideline, failure to endorse a false item could have resulted from either a deliberate choice not to endorse the item or a lack of knowledge of the guideline. More than half of the participants did not endorse each of the false guidelines in the pre- and postperformance questionnaire, but approximately one quarter to one half of the participants endorsed the questionnaire items for the true

guidelines. This suggested that endorsement of the true guideline items was a more sensitive measure of the participants' knowledge of the guidelines.

Table 3 shows the different response patterns to the false and true guidelines. The participants who had incorrect endorsements of the guidelines for Questions 1 to 6 pre- and posttest were 9.6%(17), 37.3% (66), 9.0% (16), 31% (55), 1%, 30.5% (30.5), and 6.2% (11), respectively. The participants who had incorrect endorsements on the pretest and advanced to correct endorsements on the posttest for Questions 1 to 6 were 26% (46), 39.5% (70), 11.9% (21), 19.2% (34), 25.4% (45), and 16.4% (29), respectively. The participants who had the correct endorsements of the guidelines on the pretest and maintained them on the posttest ranged from 19.8% (35) to 73.4% (130). However, the participants who had correct endorsements of the guidelines on the pretest and incorrect endorsements of the guidelines on the posttest ranged from 3.4% (6) to 9.6% (17).

Table 3

Response Patterns for Breast Health Guideline Questions Pre- and Postperformance

	Q1 (False)	Q2 (True)	Q3 (False)	Q4 (True)	Q5 (True)	Q6 (False)
Incorrect → incorrect	17 (9.6%)	66 (37.3%)	16 (9.0%)	55 (31.1%)	54 (30.5%)	11 (6.2%)
Incorrect → correct	46 (26.0%)	70 (39.5%)	21 (11.9%)	34 (19.2%)	45 (25.4%)	29 (16.4%)
Correct → correct	98 (55.4%)	35 (19.8%)	130 (73.4%)	75 (42.4%)	55 (31.1%)	120 (67.8%)
Correct → incorrect	16 (9.0%)	6 (3.4%)	10 (5.6%)	13 (7.3%)	23 (13.0%)	17 (9.6%)

Because of the greater sensitivity of the true guideline items suggested by the data, these three items were combined into a single scale. Table 4 describes the distribution of the number of true guidelines (Q2, Q4, and Q5) endorsed on the pre- and postperformance surveys. A significant increase was observed, $p < .01$ (Signed Rank test

= 2017.5) in the number of correct items endorsed following the performance. Approximately 24% (42) of the participants did not endorse any of the true guidelines at pretest, but on the postperformance survey, that decreased to about 11% (20). A significant increase of endorsement of all three guidelines from pre- to postperformance surveys was observed. However, the change of endorsement of two true guidelines from pre- to posttest was minimal, and a 10% (22) reduction of endorsements of one true guideline on the posttest was detected.

Table 4

Distribution of True Guidelines Endorsed Pre- and Posterformance

Number of true guidelines endorsed (knowledge score)	Pretest		Posttest	
None	42	23.7%	20	11.3%
One	77	43.5%	55	31.1%
Two	44	24.9%	47	26.6%
Three	14	7.9%	55	31.1%

N = 177

Instrument Reliability and Validity

Reliability

Although the breast health guideline questions were asked in the pre- and postintervention questionnaires, test-retest reliability could not be assessed on the items because the intervention was designed to change the participants' knowledge of the guidelines. The participants did answer an item on age at last birthday on both questionnaires. All participants recorded their ages consistently across the two questionnaires (r = 1.00).

Internal Consistency

The researcher used the KR-20 to assess how well dichotomous items measured the same underlying concept, in this case, knowledge of breast health guidelines. A variable was constructed for each guideline item at pretest, where a correct response (i.e., not endorsing a false guideline or endorsing a true guideline) was given a value of 1, and an incorrect response was given a value of 0. Cronbach's alpha for the raw variables was 0.32, indicating a marginal degree of item cohesion. Cronbach's alpha for a scale of the three true guidelines was 0.19. Tables 5 and 6 detail the correlation between correct responses pretest and posttest. On the pretest, the item pairs on BSE for Questions 1 and 2, mammogram for Questions 3 and 6, and CBE on Questions 5 and 6 were significantly correlated with one another. On the posttest, for all of the item pairs, significant ($p < .01$) correlations between the false guidelines and the true guidelines were observed.

Table 5

Correlation Matrix of Endorsement of Correct Responses to Pretest Guidelines[*]

Guideline	Q1	Q2	Q3	Q4	Q5	Q6
Q1: BSE (False)	1	0.21	0.02	-0.09	-0.03	0.16
		(< .01)	(.75)	(.25)	(.70)	(.03)
Q2: BSE (True)		1	-0.08	0.07	0.00	-0.02
			(.29)	(.35)	(.98)	(.76)
Q3: Mammogram (False)			1	0.12	0.09	0.35
				(.11)	(.22)	(< .01)
Q4: Mammogram (True)				1	0.14	-0.03
					(.06)	(.69)
Q5: CBE (True)					1	0.21
						(.01)
Q6: CBE (False)						1

[*] *p* values in parentheses

Table 6

Correlation Matrix of Endorsement of Correct Responses to Posttest Guidelines[*]

Guideline	Q1	Q2	Q3	Q4	Q5	Q6
Q1: BSE (False)	1	0.25	0.29	-0.02	0.05	0.31
		(< .01)	(< .01)	(.79)	(.53)	(< .01)
Q2: BSE (True)		1	0.18	0.13	0.27	0.14
			(0.02)	(.10)	(< .01)	(.05)
Q3: Mammogram (False)			1	0.23	0.12	0.43
				(< .01)	(.11)	(< .01)
Q4: Mammogram (True)				1	0.22	0.07
					(< .01)	(.35)
Q5: CBE (True)					1	0.21
						(< .01)
Q6: CBE (False)						1

Construct Validity

Kendall's tau correlation coefficient was calculated between the ordinal education variable and the number of true guidelines endorsed at pretest. The association between education and true guideline endorsement was significant but weak ($\tau = 0.15$, $p = .03$).

Criterion Validity

Criterion validity was assessed by examining whether the participants' endorsement of true guidelines on the preperformance survey was consistent with their self-reported compliance of the recommended breast health guidelines. No significant relationship was observed between the participants' self-reported behavior and their endorsement of any of the three true guideline items. For the guideline on monthly BSE, 31% (40) of the participants who did not endorse the guideline at pretest reported being compliant with the recommended guideline. However, only 39% (16) of the participants who endorsed the guideline reported having engaged in the recommended breast health

behavior. Regarding annual mammogram screening, about 55% (16) of the participants who did not endorse the guideline reported having followed the recommended guideline. A similar pattern was observed for the item on CBE; 74% (73) of those who did not endorse the item reported having a CBE (see Table 7).

Table 7

Assessment of Consistency Between Endorsement of True Guidelines and Self-Reported Compliance at Pretest

Engaged in breast health behavior according to guidelines	No. of participants	Engaged in behavior		Continuity adjusted chi-square p value
Monthly BSE, if age 20 or over				
Does not endorse item	129	40	31.0%	0.45
Endorses item	41	16	39.0%	
Mammogram in past year, if age 40 or over				
Does not endorse item	29	16	55.2%	1
Endorses item	32	18	56.3%	
CBE in past year, if over age 40 or over, CBE within 2-5 years, if age 20-39				
Does not endorse item	99	73	73.7%	0.28
Endorses item	77	63	81.8%	

H_{01}: After watching the theatrical preschool performance, the participants will not score higher on knowledge of the Susan G. Komen for the Cure's breast health guidelines at posttest than at pretest.

H_{a1}: After watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest.

The theatrical school performance was predicted to increase the participants' knowledge of breast health screening guidelines, as measured by the number of correct

guidelines identified in the pre- and postperformance questionnaires. The mean (*SD*) difference in scores was 0.6 (1.0), t (176) = 8.04, $p < .01$. The range of possible score differences was limited from -3 to 3, which constrained the range for a normally distributed population. Therefore, a nonparametric signed rank test was applied to test the difference between pre- and postscores (Conover, 1999). The *S* statistic for the signed rank test (2017.5) was significant at $p < .01$, confirming the results of the dependent t test.

Analyses of the individual true guideline responses reveal striking patterns. Endorsement of Question 2, which dealt with BSE, increased from 23.2% (41) correct at pretest to 59.3% (105) correct at posttest. Endorsement of Question 4, which dealt with mammograms, increased from 49.7% (88) at pretest to 61.6% (109) at posttest, and endorsement of Question 5, which dealt with CBEs, increased from 44.1% (78) at pretest to 56.5% (100) at posttest. All these differences were statistically significant, as measured by paired t tests and McNemar's test (Conover, 1999). Table 8 shows the participants' scores on knowledge change of true guidelines endorsed from pre- to postperformance tests. Approximately 10% (18) of the participants had a negative score in knowledge gain; about 42%(74) scored 0, which indicated no knowledge gain; about 28% (50) scored 1; more than 16% (29) had a score of 2; and about 3% (6) had a score of 3.

Table 8

Knowledge Change

Scores in true guidelines endorsed	*n*	Percent
-2	1	0.6%
-1	17	9.6%
0	74	41.8%
1	50	28.2%
2	29	16.4%
3	6	3.4%
Total	177	100%

The results of the data analysis rejects the null hypothesis ($p < .01$) that adult females who watched the theatrical preschool performance will not score higher on knowledge of the Susan G. Komen for the Cure's breast health guidelines at posttest than at pretest.

H_{02}: The participants' knowledge score at posttest will not be positively associated with self-reported acculturation and attentiveness to the theatrical performance.

H_{a2}: The participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance.

The relationship between any increase in knowledge score and attentiveness, acculturation, and potentially confounding variables was assessed with logistic regressions. The effect of each variable was tested separately with likelihood ratio tests for each regression model. The results are reported in Table 9. None of the dependent variables was associated with any increase in knowledge score.

Table 9

Summary of Chi-Square Statistics for Likelihood Ration Tests in Logistic Regression Analysis for Variables Predicting Increase in Knowledge Score

Dependent variables	Chi-square	*df*	Pr > ChiSq
More attentive	0.19	1	0.66
Mother of child	1.47	1	0.22
Education	0.27	2	0.88
Born in the United States	4.90	1	0.08
In the United States longer than 10 years	0.26	1	0.61
Marital status	0.30	2	0.86
Age	0.52	1	0.47
Annual household income	4.66	3	0.20
Has health insurance	2.04	1	0.15

The conversion of change in knowledge score to a binary variable resulted in the loss of some information; perhaps logistic regression results might not have been powerful enough to detect weak associations. Standard linear regression and *F* tests were used to predicate changes in the knowledge score using the participants' demographics and relationship to the preschoolers as the independent variables. Table 10 illustrates the results of the analysis, which indicated that only the variable of being born in the United States impacted the knowledge score outcome. The participants who were born in the United States improved their knowledge scores by 0.42 (*SE* 0.21) points more than the participants who were born outside of the United States.

Table 10

Summary of F Tests in Regression Analysis for Variables Predicting Change in Knowledge Score

Dependent variables	*df*	*F* Value	Pr > *F*
More attentive	1, 150	1.00	0.32
Mother of child	1, 150	0.03	0.86
Education	2, 149	1.01	0.37
Born in the United States	1, 150	4.02	0.05*
In the United States longer than 10 years	1, 150	0.96	0.33
Marital status	2, 149	1.70	0.19
Age	1, 150	0.39	0.53
Annual household income	3, 148	0.79	0.50
Has health insurance	1, 150	0.40	0.53

Note. B = 0.42, *SE* B = 0.21, R^2 = 0.02 for born in the United States

The findings from the study accepted the null hypothesis ($p > .01$) that the participants' scores on knowledge of the breast cancer screening guidelines at posttest will not be positively associated with self-reported acculturation and attentiveness to the preschool performance.

Findings

Knowledge of Breast Health Guidelines

This study, through pre- and posttheatrical preschool performance surveys, assessed whether the participants gained knowledge on breast health guidelines after the performance and whether the knowledge gain was associated with the participants' demographics related to acculturation and self-reported attention given to the performance. The participants who had scores of 1 or higher on a list of six questions on breast health guidelines pre- and postperformance had a knowledge gain on breast health

guidelines. The participants who had scores of 0 or negative had no knowledge gain on the breast health guidelines.

The findings indicated a significant knowledge gain in knowledge of breast health guidelines postperformance. The percentage endorsement of all three breast health guidelines showed a statistically significant gain in knowledge after the performance ($p < .01$). The guideline on BSE had a knowledge increase from 23.2% (41) at baseline to 59.3% (105) after the performance, which was nearly double the number of endorsements of the guideline posttest. For the true guidelines on screening mammogram and CBE, the knowledge changes were 11.9% (21) and 12.4% (22), respectively. For the false guidelines, only the BSE had a statistical significant knowledge gain ($p < .01$); the false guidelines of mammogram screening and CBE did not show a statistical significant gain in knowledge.

However, the pattern of endorsement of the true and false guideline items suggested that the endorsement of the true guideline items was a more sensitive measure of the participants' knowledge of the guidelines because the participants who left the items on the false guidelines blank either did not know the answers or recognized that they were false guidelines. In contrast, the participants who endorsed the true guidelines on the posttest were more likely to do so because of the knowledge gained after the performance. Furthermore, when all three true guidelines were combined into a single scale, a significant ($p < .01$) increase in knowledge was observed; the participants who endorsed all three guidelines correctly had increased from 7.9% (14) at baseline to 31.1% (55) postperformance.

Impact of Acculturation and Attentiveness on Knowledge Score

Two independent variables were used to measure acculturation: length of residency in the United States and birth country. The data analyses demonstrated no significant association between the variable on length of residency and knowledge gain, but the findings indicated a significant ($p < .01$) impact on the participants' knowledge score from the variable of being born in the United States. No significant impact was detected between knowledge score and attentiveness to the theatrical performance and any of the demographic variables.

Summary

Data from this study confirmed H_{a1}, which stated that after watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest. Statistically significant changes in knowledge gain from preperformance test to postperformance test were observed. The data analysis was performed using a nonparametric signed rank test, the *S* statistic for the signed rank test, and the paired *t* tests and McNemar's test. However, the results of the data analyses rejected H_{a2}, which stated that the participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance. The results of the analysis indicated that none of the dependent variables used to measure attentiveness to the performance and acculturation was associated with any gain on the knowledge score of the breast cancer screening guidelines. Only the variable of being born in the United States significantly

impacted the knowledge score outcomes. The data analysis for H_{a2} employed logistic regression, standard linear regression, and *F* tests. The results of the data analyses are discussed in chapter 5, along with recommendation for public health, a discussion of future research involving young children in delivering health messages, and implications for social change.

CHAPTER 5: DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Overview

Research has suggested that the lack of participation in breast cancer screenings by ethnic communities often is associated with language barriers and different cultural beliefs (Jacobs, Karavolos, Rathouz, Ferris, & Powell, 2005; Kandula, Wen, Jacobs, & Lauderdale, 2006). To help minority women overcome the barriers to breast cancer screening, breast cancer early detection programs should be tailored to the women's linguistic and cultural preferences (Goel et al., 2003; Jacobs et al., 2005; Kandula et al., 2006). Theatrical plays or drama has been found effective in delivering various health messages (Cueva, 2006; Parrott, 2004). In the Chinese community, performances involving preschoolers often take place at church gatherings, preschool graduations, fundraising events, and community events, but no study has involved young preschool-age children as change agents to influence adults' knowledge of breast cancer screening.

Previous studies have focused on the influence of older children on parental behaviors related to nutrition, food choices, and conservation of the environment. Limited studies have involved young children ages 3 to 5 as a conduit of influence on adults' knowledge and behavioral changes (Robinson et al., 2007). Although the data are limited, evidence has suggested that young children can be effective change agents in influencing adults' health-related knowledge and practices (Bhore et al., 1992; Brown & Ogden, 2004; Jacob et al., 1994; Johannsen et al., 2006; Okada et al., 2002).

This study was intended to address the problem of late-stage diagnosis of breast cancer in the Chinese immigrant community through a secondary data analysis of pre and

posttheatrical performance surveys. The purpose of the study was to determine whether a culturally and linguistically competent cancer control program, guided by the diffusion of innovation theory (Rogers, 1962), can raise awareness among Chinese immigrant women about the breast cancer screening guidelines published by the Susan G. Komen for the Cure (2008). Following are the research questions and hypotheses:

1. Did a theatrical preschool performance increase the study participants' knowledge of breast cancer screening guidelines?
2. Were acculturation and attentiveness to the performance associated with the study participants' knowledge gain?

H_{01}: After watching the theatrical preschool performance, the participants will not score higher on knowledge of the Susan G. Komen for the Cure's breast health guidelines at posttest than at pretest.

H_{a1}: After watching the theatrical preschool performance, the participants will have an increased knowledge score at posttest on breast health guidelines based on the Susan G. Komen for the Cure as compared to pretest.

H_{02}: The participants' knowledge score at posttest will not be positively associated with self-reported acculturation and attentiveness to the theatrical performance.

H_{a2}: The participants' knowledge score at posttest will be positively associated with both the participants' degree of acculturation and reports of attentiveness to the theatrical performance.

The 20-minute theatrical preschool performance was performed by Chinese children between the ages of 3 and 5. In the performance, breast health guidelines published by the Susan G. Komen for the Cure (2008) were shown to the relatives of the performers. A total of 177 pre- and postperformance surveys were collected from four San Francisco preschools immediately before and after the performance. The findings showed that the participants significantly ($p < .01$) increased their knowledge scores on breast cancer screening guidelines after watching the preschool theatric performance and that there were no significant associations between the participants' knowledge scores and any of their demographic characteristics, including self-reported attentiveness to the performance, except the variable of being born in United States.

Discussion and Interpretation of the Findings

The current study, through pre- and posttheatrical preschool performance surveys, assessed whether the participants gained knowledge of breast health guidelines after the performance and whether the knowledge gain was associated with the participants' demographics related to acculturation and self-reported attention given to the performance. The participants who scored 1 or higher through a list of six questions on breast health guidelines pre- and postperformance were considered to have a knowledge gain of breast health guidelines. The participants who had scores of 0 or negative were considered to have no knowledge gain of the breast health guidelines.

Knowledge of Breast Health Guidelines

Researchers (Goel et al., 2003; Jacobs et al., 2005; Kandula et al., 2006) have suggested that to increase compliance with breast cancer screening recommendations,

cancer education and early detection programs should be culturally and linguistically tailored to the targeted population. Breast cancer early detection messages aimed at Chinese Americans must consider ways to creatively and effectively raise awareness of breast health guidelines as well as relay the message that the guidelines are effective in detecting the early stages of cancer before it advances enough to cause symptoms.

The findings from this study showed that the preschool theatrical performance tailored to the targeted population was a culturally and linguistically effective venue in educating Chinese American women about the recommended breast health guidelines. Although the researcher did not investigate behavioral change related to breast cancer screening following the performance, other researchers (Bandura, 1977; Marx, Nedelmann, Haertle, Dieterich, & Eicke, 2008; Petraglia, 2009; Redding, Rossi, Rossi, Velicer, & Prochaska, 2000) have suggested that behavioral change is usually achieved through knowledge gained. Without first equipping Chinese immigrant women with knowledge about the recommended breast health guidelines, it is less likely that the women will follow with the recommended breast cancer screening behavior.

To facilitate the adherence of women from the ethnic community to the guidelines related to screening mammogram and CBE, efforts must be made to reduce financial and linguistic barriers. The results of this study revealed that endorsement of the true guidelines on BSE from baseline to postperformance had the highest increase in knowledge change (36.2%, 64) among all three guidelines. The finding may have indicated that during the performance, the women paid more attention to BSEs because there are minimal barriers associated with performing this exam compared to other two

guidelines. Researchers (Tang et al., 2000; Womeodu & Bailey, 1996; Young & Severson, 2005) have identified such barriers as the lack of insurance, high copay deductibles, inability to take time off work for screening appointments, insufficient English language skills, and fear of pain during the mammography procedure in obtaining a mammography and a CBE.

Knowledge of Breast Health Guidelines and Acculturation

Although breast cancer is a leading cause of cancer mortality and accounts for the highest rate of all cancers among Chinese Americans, and even though early detection has proven to be the key in decreasing mortality and improving survival rates from breast cancer (Berry et al., 2005; Lacey, Devesa, & Brinton, 2002), studies have reported that Chinese Americans often underutilize available breast cancer screening tools (M. Yu & Wu, 2004). According to the ACS (2007), cultural beliefs and practices contribute to cancer screening disparities. In addition, limited English proficiency often is associated with low compliance among Asian Americans with cancer screening recommendations (M. S. Chen, 2005).

In addition, the literature showed that many Chinese immigrant Americans may not grasp the concept of cancer prevention through Western approaches (Spector, 1991); instead, they believe that cancer can be prevented by balancing the energy in the body and practicing a moral lifestyle (Coward & Ratanakul, 1999). Based on this holistic concept, many foreign-born Chinese do not understand the reason for obtaining a screening test if there is no display of symptoms of illness. This lack of comprehension of Western health prevention approaches also may explain the findings from this study that

the variable of being born in the United States did significantly impact the participants' knowledge scores. The results suggested that the participants who were born in the United States are more accustomed to the idea of health prevention through the recommended health guidelines.

Kandula et al. (2006) concluded that when the participants in their study were asked to identify important reasons for not obtaining the recommended cancer screening tests, the foreign-born Asians were significantly more likely than those who were born in the United States to list the lack of symptoms of illness or because they "felt fine" As one reason. The current study's finding were consistent with those from studies that being foreign born is a contributing factor to disparities in cancer screening (Akers, Newmann, & Smith, 2007; Goel et al., 2003; M. Yu, Hong, & Seetoo, 2003). However, when using length of stay in the United States as an acculturation variable, no significant association was detected between the variable and the participants' knowledge scores.

Young Children as Change Agents

Researchers (Backer & Rogers, 1998; Levy-Storms & Wallace, 2003) guided by the diffusion of innovation theory (Rogers, 1962) have demonstrated the efficacy of employing change agents in the promotion of mammograms and AIDS prevention. Researchers (Brown & Ogden, 2004; Jacob et al., 1994; Johannsen et al., 2006; Okada et al., 2002) have suggested that children can be a conduit to transfer knowledge to their parents or other adults; it should be noted that these studies did not use the diffusion of innovation theory as their framework. Researchers (Angres, 1975; Bottorff, 1970; Chaffee et al., Tipton, 1970; Flurry, 2007; Hagestad, 1977; R. L. Jenkins, 1979; Meyers,

2004; Roy, 2004; Turner et al., 2006) also have demonstrated the influence of children on their parents' decision outcomes regarding attitudes and practices related to various areas, such as of the purchase of household items, nutrition, and health.

In business marketing, this theory is frequently applied to commercial promotion efforts (Grier et al., 2007). The current study, guided by the diffusion of innovation theory, demonstrated the efficacy of involving young children as change agents to promote breast health among Chinese American women through a preschool theatrical performance. In addition, the findings detected no significant relationships among the participants' knowledge gain and their demographic characteristics, length of stay in the United States, and relationship to the children in the play. The findings suggested that involving young children as change agents in delivering simple health messages such as breast cancer early detection recommendations can be effective, regardless of the participants' ages, socioeconomic status, and relationship to the children in the performance.

The results from the study were consistent with the findings from Bhore et al.'s (1992) study, which involved young children in delivering health messages associated with negative connotations. They concluded that the children helped to lessen the stigma connected with certain health topics and enhanced the participants' knowledge gain about the subject. Several studies have reported that some Asian Americans believe that cancer is punishment for transgressions in this life and past lives and that cancer is contagious (C. H. Jenkins & Kagawa-Singer, 1994; Sun et al., 2005).

Other studies (Kite & Smucker, 1994; Lowe, 2002; Silver, 2001) have demonstrated that art, songs, story telling, and drama can facilitate learning and reduce learning barriers. A theatrical performance involving young children and using art and songs was intended to help Chinese American women to learn about breast health guidelines in an environment that was artistic yet familiar to the Chinese women. The Chinese character for learning consists of undivided symbols for the eyes, ears, and heart (Cueva, 2006). Theatrical performances involving young children invariably invite the participants to learn through the active engagement of the undivided learning symbols of the eyes, ears, and heart. The findings from this study also confirmed that involving young children as change agents was an effective way to deliver breast health messages because it significantly raised the participants' knowledge about breast cancer early detection after the performance.

Correlation Between Knowledge of Breast Health Guidelines and Self-Reported Health Behaviors

Knowledge and behaviors are closely related (Bandura, 2004; Kolbe et al., 1996; Powell et al., 2007). However, this study did not detect any significant correlation between knowledge of breast health guidelines and self-reported breast health behaviors at pretest. Two possible interpretations may explain these findings. First, the responses concerning the participants' compliance with the recommended breast health behaviors may not have reflected their actual breast health practices accurately. McPhee et al. (2002) suggested that culturally, Asian American women are more likely than White women to provide responses based on their assessment of the desirable responses, even if the responses do not reflect their actual behaviors and beliefs. Second, because the

answers about actual breast health behaviors were on screening tests that might have been performed some time ago, recollection of these items may have exhibited variance of correlation, as suggested by the literature (Caplan et al., 2003; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Sirovich, Schwartz, & Woloshin, 2003).

Correlation Between Knowledge Scores and Attentiveness

The item on attentiveness had some limitations because it asked the participants to compare attention given to the theatric performance to that of other interventions. The assessment of this item depended on the participants' recollection when they completed the pretest of their experiences of various educational delivery methods. Although no significant correlation was detected between knowledge gain and self-reported attentiveness to the performance, the results of the study identified a significant ($p < .01$) increase in the knowledge scores, both in the summary scores and the individual scores, of the guidelines after the performance. The findings indicated that the participants did pay attention to the theatric performance, even though they may have thought that they were not paying attention.

Correlation Matrix of Endorsement of Correct Responses to Guidelines

The correlation within and between pairs of true and false guidelines measures how well the dichotomous items within each pair of guidelines measure the same underlying concept. The findings from this study suggested that there were fewer correlations within and between each pair of breast health guidelines preperformance. There were correlations detected within only the pairs of guidelines on BSE and CBE. However, at postperformance, the correlations improved between each pair of guidelines.

Significant ($p < .01$) correlations were detected within the paired items on BSE, annual mammogram, and CBE.

Implications for Social Change

Research has found that the lack of adherence to recommended breast health guidelines contributes to the late diagnosis of breast cancer and increases the breast cancer mortality rate (Reddy & Given-Wilson, 2006; Smith, 2005; Smith et al., 2003). The results of the current study were consistent with the findings from previous studies that culturally and linguistically appropriate early breast cancer education and detection programs are effective in persuading ethnic Americans to follow the recommended screening guidelines (Goel et al., 2003; Jacobs et al., 2005; E. S. H. Yu, Kim, Chen, & Brintnall, 2001). The findings indicated that a preschool theatrical performance can be an effective way to increase the knowledge of Chinese American women about breast health guidelines, regardless of their age, socioeconomic status, educational level, or marital status. This method of delivering the message can be utilized across all ethnic groups and health topics.

This study may influence positive social change by providing public health practitioners, especially those who work with the Asian community, with an effective venue of delivering breast health messages through preschool theatric performances. The United States is experiencing a fast-growing Asian population (U.S. Census, 2007), so it is critical that public health administrators become knowledgeable about and more skilled in reaching out to this ethnic community. Public health practitioners also may wish to

consider adopting the method for preschool theatrical performances to convey other health messages to different ethnic communities.

As suggested by the literature (Kandula et al., 2006; Lee, 2000; Pasick et al., 1996), delivering health care messages regarding cancer care and testing in culturally effective ways is essential for the targeted population to gain knowledge about the topic, which may then influence their decision to comply with early cancer detection recommendations. The most significant social changes that the current study may precipitate are improved cancer survivorship rates and reduced rates of cancer mortality because of the increased utilization of available cancer screening tools. The current study also will lead to social change by demonstrating the ways in which young children can influence their parents and relatives to learn about breast health guidelines through preschool theatrical performances.

Recommendations for Public Health Action

Public health professionals must continue to seek ways to reduce breast cancer screening disparities in ethnic communities. Culturally and linguistically appropriate education programs on early breast cancer detection are critical to tackle the barriers regarding the late diagnosis of breast cancer in the Chinese community effectively.

The findings of the study will be disseminated through publications; presentations at community forums; and professional meetings and conferences, such as the annual meeting of the Asian American Network on Cancer Awareness, Research and Training, and the annual meeting of the American Public Health Association. The results will give public health professionals insight into culturally competent ways to address issues

related to the underutilization of breast cancer screening. This method of involving young children as change agents also may be used to deliver other health messages that target all populations, regardless of age groups, educational levels, socioeconomic status, and length of stay in the United States. This approach might be especially valuable in addressing public health issues associated with a stigma such as cancer.

Recommendations for Future Study

Although experimental investigations have been conducted on the use of drama in delivering health messages, there has been a lack of empirical study on the efficacy of involving young children ages 3 to 5 to deliver breast cancer early detection messages through theatrical performance. The results of this study provided preliminary data on the efficacy of conveying breast health message through preschool theatrical performance. The available data from this study may provide some of the groundwork for further empirical investigations. Public health researchers may consider designing studies that engage preschool-age children to deliver various health topics, especially those associated with such stigma as cancer, mental health disorders, epilepsy, hospice, and so on.

Furthermore, a combination of quantitative and qualitative studies also could be valuable. Because of limited funds, the researcher of the current study employed only a quantitative approach and did not include a follow-up mechanism to determine whether there were any breast cancer screening behavior changes after the performance. A qualitative approach, along with a quantitative design, would provide in-depth data to explain why young children impacted the participants' knowledge gain as well as their

behavior changes. It also would be helpful for future investigations to employ a randomized experimental study approach that is guided by the diffusion of innovation theoretic framework. This approach would confirm the findings from this study on efficacy involving young children as change agents to promote breast health screening among Chinese American women through preschool theatrical performance.

Conclusion

The late diagnosis of breast cancer and the underutilization of breast cancer screening tools were the impetus for this quasi-experimental study. Although some empirical data have demonstrated the efficacy of involving children in drama to deliver health messages in an effort to influence adults' knowledge and behavior, no empirical studies have involved preschool-age children as change agents to influence adults' knowledge of breast health guidelines through theatrical performance. The data from this pilot study demonstrated that promoting breast health screening guidelines among Chinese American women through young children's theatrical performance significantly increased the participants' knowledge about the guidelines. In addition, the data suggested that the preschool theatrical performance can be an effective way to deliver breast health messages to all Chinese American women, regardless of their ages, level of education, socioeconomic status, marital status, and relationship to the children in the play. Although the current study tested only the topic of breast health guidelines among a sample of Chinese American women, the approach can be utilized to convey health messages across other ethnic groups.

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APPENDIX: PRE- AND POSTQUESTIONNAIRES (ENGLISH & CHINESE)

Participant ID # ☐☐☐

Health Education Program Involving Preschoolers
Pre-Questionnaire
(For Female Adults 18 years or older only)

1. **Which of the following is (are) guideline(s) for breast health? (Okay to select more than one answer.)**
   - ☐ Practice breast self-exam monthly if you are aged 18 or older
   - ☐ Practice breast self-exam monthly if you are aged 20 or older
   - ☐ Have a mammogram annually if you are aged 50 or older
   - ☐ Have a mammogram annually if you are aged 40 or older
   - ☐ Have breast exam performed by a healthcare provider every 3 years if you are aged 20 - 39 and annually if you are aged 40 or older
   - ☐ Have breast exam performed by a healthcare provider every 3 years if you are aged 18 - 49 and annually if you are aged 50 or older

2. **How often do you perform breast self-exam (BSE)?**
   - ☐ Never
   - ☐ More than once a month
   - ☐ Once a month
   - ☐ Less than once a month
   - ☐ Once in my lifetime Date: ☐☐☐☐☐☐☐☐

3. **Have you ever had a mammogram?** ☐ Yes ☐ No

   If yes, when did you have your last mammogram?
   - ☐ Within the last 12 months
   - ☐ 13-23 months ago
   - ☐ 2-5 years ago
   - ☐ More than 5 years ago
   - ☐ Once in my lifetime Date: ☐☐☐☐☐☐☐☐

4. **Have you ever had a breast exam performed by a healthcare provider?** ☐ Yes ☐ No

   If yes, when did a healthcare provider last examine your breasts?
   - ☐ Within the last 12 months
   - ☐ 13-23 months ago.
   - ☐ 2-5 years ago
   - ☐ More than 5 years ago.
   - ☐ Once in my lifetime Date: ☐☐☐☐☐☐☐☐

5. **How old were you on your last birthday?** ☐☐

Participant ID # ☐☐☐

Health Education Program Involving Preschoolers
Post-Questionnaire
(For Female Adults 18 years or older only)

1. **Which of the following is(are) guideline(s) for breast health? (Okay to select more than one answer.)**
   - ☐ Practice breast self-exam monthly if you are aged 18 or older
   - ☐ Practice breast self-exam monthly if you are aged 20 or older
   - ☐ Have a mammogram annually if you are aged 50 or older
   - ☐ Have a mammogram annually if you are aged 40 or older
   - ☐ Have breast exam performed by a healthcare provider every 3 years if you are aged 20 - 39 and annually if you are aged 40 or older
   - ☐ Have breast exam performed by a healthcare provider every 3 years if you are aged 18 - 49 and annually if you are aged 50 or older

After hearing the breast cancer message delivered by the preschoolers, do you intend to:

2. **Perform breast self-exam (BSE) monthly?** ☐ Yes ☐ No

3. **Have a mammogram annually beginning at age 40?** ☐ Yes ☐ No

4. **Have a breast exam performed by a healthcare provider every year after age 40?** ☐ Yes ☐ No

5. **(Answer only if you are aged 20-39) Have a breast exam performed by a healthcare provider every 3 years until you reach age 40?** ☐ Yes ☐ No

6. **How are you related to the child(ren) delivering the breast health message?**
   - ☐ Mother ☐ Grandmother ☐ Aunt
   - ☐ Cousin ☐ Friend of family ☐ No relationship

7. **How much did the performance by the preschoolers today affect your plans about breast health screening?"**
   - ☐ A lot ☐ Somewhat ☐ Not very much ☐ Not at all

8. How would you describe your attentiveness to the health messages that were incorporated into the children's performance compared to those that are delivered by conventional channels (e.g. health brochures, videos, seminars, & etc.)?

☐ Much more attentive ☐ Slightly more attentive ☐ Same ☐ Slightly less attentive ☐ Much less attentive

9. How old were you on your last birthday? ☐☐

10. Marital status

☐ Never been married ☐ Married
☐ Divorced or separated ☐ Widowed

11. In what country were you born? ☐

12. How many years have you lived in the U.S.? ☐☐

13. How much education have you completed?

☐ Less than High School ☐ High School graduate ☐ Vocational/technical school
☐ Some college ☐ College graduate ☐ Graduate degree

14. What is your annual household income?

☐ Less than $30,000 ☐ $30,000 - $50,000
☐ $50,001 - $80,000 ☐ More than $80,000

15. Do you have health insurance? ☐ Yes ☐ No

16. Ethnic Background

☐ Chinese ☐ Vietnamese
☐ Caucasian ☐ Inter-racial
☐ Other Asian (Specify) _____

學前兒童參與健康教育宣傳

問卷調查 （宣傳前）

（供 18 歲或以上女性填寫）

答卷人編號：☐☐☐

1. 以下那一條或幾條是屬於乳部健康指引？（請至少√一條，但可以選擇多過一條）
   - ☐ 如果您是 18 歲或以上，應每月做自我乳部檢查。
   - ☐ 如果您是 20 歲或以上，應每月做自我乳部檢查。
   - ☐ 如果您是 50 歲或以上，應 每年做乳部 X 光檢查。
   - ☐ 如果您是 40 歲或以上，應每年做乳部 X 光檢查。
   - ☐ 如果您是屆乎 20-39 歲，應每三年由醫護人員或醫生爲您做臨床乳部檢查；40 歲或以上則應每年做一次。
   - ☐ 如果您是屆乎 18-49 歲，應每三年由醫護人員或醫生爲您做臨床乳部檢查；50 歲或以上則應每年做一次。

2. 您多久做一次自我乳部檢查 (BSE)？（請至少√一條）
   - ☐ 從來不做。
   - ☐ 一個月做多過一次。
   - ☐ 每月一次。
   - ☐ 一個月不夠一次。
   - ☐ 一生只做過一次，日期：

3. 您曾做過乳部 X 光檢查嗎？（請至少√一條）
   - ☐ 有　　☐ 沒有

   如有做，最近一次乳部 X 光檢查是多久以前？
   - ☐ 一年之內
   - ☐ 十三個月至二十三個月之前
   - ☐ 二至五年之前
   - ☐ 五年以上
   - ☐ 一生只做過一次，日期：

4. 您曾由醫護人員或醫生爲您做臨床乳部檢查嗎？（請至少√一條）
   - ☐ 有　　☐ 沒有

   如有，最近一次臨床乳部檢查是多久以前？
   - ☐ 一年之內
   - ☐ 十三個月至二十三個月之前
   - ☐ 二至五年之前
   - ☐ 五年以上
   - ☐ 一生只做過一次，日期：

5. 上一次生日時您多大？☐☐☐

學前兒童參與健康教育宣傳
問卷調查 （聽過兒童講述後）
（供 18 歲或以上女性填寫）

答卷人編號：☐☐☐

1. 以下那一條或幾條是屬於乳部健康指引？（可以選擇多過一條）

☐ 如果您是 18 歲或以上，應每月做自我乳部檢查。

☐ 如果您是 20 歲或以上，應每月做自我乳部檢查。

☐ 如果您是 50 歲或以上，應 每年做乳部 X 光檢查。

☐ 如果您是 40 歲或以上，應每年做乳部 X 光檢查。

☐ 如果您是屆乎 20-39 歲，應每三年由醫護人員或醫生爲您做臨床乳部檢查；40 歲或以上則應每年做一次。

☐ 如果您是屆乎 18-49 歲，應每三年由醫護人員或醫生爲您做臨床乳部檢查；50 歲或以上則應每年做一次。

聽過兒童傳述有關乳部健康的指引後，您是否打算做到以下各項：

2. 每月做自我乳部檢查 (BSE)？ ☐ 會 ☐ 不會

3. 40 歲開始，每年做乳部 X 光檢查？ ☐ 會 ☐ 不會

4. 40 歲開始，每年由醫護人員或醫生爲我做臨床乳部檢查？ ☐ 會 ☐ 不會

5. （只供 20 至 39 歲女性填寫）直至 40 歲爲止，每三年由醫護人員或醫生爲我做臨床乳部檢查？ ☐ 會 ☐ 不會

6. 你與傳述有關乳部健康指引的兒童的關係？

☐ 母親 ☐ 祖母 ☐ 姑姑姨姨
☐ 表姐妹 ☐ 家庭朋友 ☐ 非親屬關係

7. 今天經兒童爲您做宣傳，會如何影響你日後對乳部健康的計劃？

☐ 很大影響 ☐ 有些影響 ☐ 不大影響 ☐ 一點也不影響

8. 您認爲經由兒童傳述有關乳部健康的指引，與經由其他慣例的宣傳途徑（例如，健康小冊子，電視，講座等等）比較，如何較爲容易接受？

☐ 更容易接受　☐ 較爲容易接受　☐ 無多大區別　☐ 有點不容易接受　☐ 不容易接受

9. 上一次生日時您多大？ ☐☐

10. 婚姻狀況　☐ 未結婚　☐ 已婚　☐ 離婚或分居　☐ 失偶

11. 出生國籍 ☐

12. 在美國居住了多少年？ ☐☐

13. 教育水平:

☐ 高中以下　☐ 高中畢業　☐ 讀過專科或技術學校
☐ 讀過大學　☐ 大學畢業　☐ 研究所學位

14. 家庭全年收入:

☐ 三萬以下　☐ 三萬至五萬
☐ 五萬零一至八萬　☐ 八萬以上

15. 您是否有健康保險？　☐ 有　☐ 沒有

16. 族裔背景

☐ 華裔　☐ 越南華僑
☐ 白種人　☐ 混血兒
☐ 其他亞裔（請注明）_____

CURRICULUM VITAE

Angela Sun

Education

1984	B.S. San Francisco State University, San Francisco, CA
1987	M.P.H. San Jose State University, San Jose, CA
2008	Certification, Community-Based Participatory Research, University of California, San Francisco, CA

Positions

1989-1995	Program Coordinator, Chinese Community Health Resource Center, San Francisco, CA
1995-2006	Director, Chinese Community Health Resource Center, San Francisco, CA
2001-2007	Program Director, Education Department, Chinese Hospital, San Francisco, CA
2006-Present	Executive Director, Chinese Community Health Resource Center, Chinese Hospital, San Francisco, CA
2008-Present	Faculty, CARTA Program, University of California San Francisco, CA

Honors and Awards

Developed the nation's first cancer support group ("I Can Cope") in the Chinese Community, recognized by and received award from the National Office of the American Cancer Society, 1994.

Wellness Excellence Awards from Health Net, 1996 and 1997.

Chinese Community Volunteer of the Year Award, American Cancer Society, San Francisco Unit, 1996.

Community Leadership Award from the American Health Plan Association, 2000.

Special Recognition Award, Regional Council of the California West Bay Region, American Cancer Society, 2000.

Special Recognition from the National Youth Leadership Forum, 2001.
Featured in the American Cancer Society Annual Report, 2001.

Developed nation's first bilingual website tailored for Chinese community, recognized and received Innovation in Multi-Cultural Healthcare Award by the National Committee for Quality Assurance, 2006.

Received NCQA in Recognizing Innovation in Multicultural Health Award, 2007.

Peer-Reviewed Publications

Wong-Kim, E., Sun, A., & DeMattos, M. C. (2003). Assessing cancer beliefs in a Chinese immigrant community. *Cancer Control, 10*(5), 22-28.

Wong-Kim, E., Sun, A., Merighi, J., & Chow, E. (2005). Understanding quality-of-life issues in Chinese women with breast cancer: A qualitative investigation. *Cancer Control, Suppl. 1*, 6-12.

Sun, A., Zhang, J., Tsoh, J., Wong-Kim, E., & Chow, E. (2007). The effectiveness in utilizing Chinese media to promote breast health among Chinese women. *Journal of Health Communication, 12,* 157-171.

Edrington, J., Dodd, M., Wong, C., Padilla, G., Paul, S., Sun, A., & Miaskowski, C. (2008). Barriers to pain management in a community sample of Chinese American patients with cancer. *Journal of Pain and Symptom Management, 37,* 665-675.