A Systematic Review of Barriers and Facilitators to Mammography in American Indian/Alaska Native Women

Bonnie Jerome-D’Emilia, PhD, MPH, CBCN, RN¹, Francine C. Gachupin, PhD, MPH², and Patricia D. Suplee, PhD, RNC-OB¹

Abstract

Introduction: The purpose of this systematic review was to synthesize the current knowledge of factors that enable or impede American Indian and Alaska Native (AI/AN) women from accessing breast cancer screening. Methodology: A systematic search of MEDLINE and CINAHL databases identified relevant research studies published from 2007 to 2017. Results: Consistent with other low-income populations, socioeconomic factors were related to lower rates of screening in AI/AN women. However, some factors, such as reliance on the Indian Health Service, cultural issues, and traditionality were unique to this population. Discussion: AI/AN women appear to face many of the difficulties that other low-income minority women face in accessing preventive care; however, they may face unique challenges and circumstances in accessing care. Efforts to work with tribes in the development of interventions framed by community-based participatory research are needed to tackle the disparities in the AI/AN community.

Keywords
health disparities, women’s health, native women, breast cancer, cancer prevention

American Indians and Alaska Natives (AI/AN) in the United States experience cancer in ways that are unique, based on their history, culture, geographic location, and reliance on a government-provided health care system, the Indian Health Service (IHS) (Centers for Disease Control and Prevention, 2018). While 60% of AI/AN individuals live in metropolitan areas (as of 2010) (U.S. Department of Health and Human Services [USDHHS], 2018), 22% continue to live on reservations, and another 18% live off the reservation but in rural localities. Median household income is lower for AI/AN individuals ($37,353), as compared with non-Hispanic Whites (NHW) ($56,565), and only 82% have a high school diploma, as compared with 92% of NHWs (USDHHS, 2018). As of 2012, only 47.5% of AI/ANs had private health insurance coverage, 38.1% were enrolled in Medicaid, and 22.6% were uninsured (USDHHS, 2018). Members of federally recognized tribes are eligible for health care services through the IHS, and some 2 million people receive care through that federally administered system. The IHS also funds urban Indian health organizations, located in cities throughout the United States (UDHHS, 2018).

Cancer is the second leading cause of death among AI (USDHHS, 2014). While AI/AN breast cancer incidence is lower than the incidence in NHW women, AI women are more likely to be diagnosed with advanced cancer than NHW women (Espey et al., 2007; Iqbal, Ginsburg Rochon, Sun, & Narod, 2015), and variations in cancer incidence and mortality among AI/ANs by IHS regions have been reported (White et al., 2014). Mammography is recommended for early breast cancer detection; however, AI/AN screening rates have historically been low (James, Gold, St. John-BlackBird, & Trinidad, 2015). While many low-income women of all races and ethnicities face barriers in access to preventive care and cancer screening, it is not clear if the barriers faced by AI/AN women are unique to this population and if interventions that have been successful in other communities might also work for the AI/AN community.

The purpose of this systematic review was to synthesize the current knowledge of the factors that enable or impede AI/AN women from accessing breast cancer screening. The framework for Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) was followed in the preparation of this article.

¹Rutgers University School of Nursing–Camden, Camden, NJ, USA
²University of Arizona, Tucson, AZ, USA

Corresponding Author:
Patricia D. Suplee, Rutgers University School of Nursing–Camden, 530 Federal Street, Camden, NJ 08102, USA.
Email: suplee@camden.rutgers.edu
Methods

A systematic search of MEDLINE and CINAHL databases identified relevant research studies published in a 10-year period, from 2007 to 2017. Search terms included Native American women, AI women, cancer screening, and breast cancer screening. The search limits were original research studies written in the English language. Inclusion criteria included NA/AI women; age 40 years and older (at least as a subsample); with attitudes, barriers, and facilitators to mammography; and studies based in the United States. The few studies that have been done on AI women and cancer screening have been based in many different geographic areas in the United States without explicating the tribal affiliation of the women included in the sample. However, narrowing the search to studies completed in the United States will result in a population of women who are all navigating the same health care system (IHS primarily) and experiencing similar issues related to insurance and access, specifically in rural settings. Some of the studies included AN women in their samples. We therefore included those studies that sampled from both AI and AN populations. Because of the limited number of relevant studies, this systematic review included quantitative, qualitative, and intervention studies.

A total of 165 articles were identified in CINAHL and Medline databases using the search terms listed above. A title screen was conducted eliminating 101 records due to duplication, to the inclusion of a very small sample of AI women within a larger study, or because the article simply presented rates of screening without any consideration of barriers or facilitators. Two of the authors, BJ-D and PDS, reviewed the 64 articles for appropriate fit. Based on the inclusion criteria, 44 articles were included for further review. These articles were reviewed by all three authors. Studies that included factors relevant to facilitators of and barriers to breast cancer screening in AI/AN women were retained, resulting in 18 articles—8 purely quantitative studies, 7 qualitative studies, and 3 intervention studies (see Figure 1).

Findings

Quantitative Studies

The eight quantitative studies (Table 1) included in this review focused primarily on barriers toward breast cancer screening, although there was some consideration of the factors that may facilitate access to mammography screening. Two of these studies focused on AI women residing in Arizona and New Mexico (Nuño et al., 2012, Schumacher et al. 2008). Schumacher et al. (2008) was the only study that specifically identified a tribe (Navajo). That study also included AN women. Five of the quantitative articles relied on data abstracted from secondary data sets: the Vermont Breast Cancer Surveillance System (Canales, Rakowski, & Howard, 2007), the California Health Interview Survey (Eberth, Huber, & Rene, 2010; Simonds, Colditz, Rudd, & Sequist, 2011), the Behavioral Risk Factor Surveillance System (Nuño et al., 2012), and the Education and Research...
<table>
<thead>
<tr>
<th>Study</th>
<th>Location/Setting</th>
<th>Sample</th>
<th>Inclusion (I)/Exclusion (E) criteria</th>
<th>Intervention/Data Collection Methods/ Theory</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canales, Rakowski, and Howard (2007)</td>
<td>Vermont</td>
<td>Random (N = 115) abstracted from the Vermont Breast Cancer Surveillance System (tracks all women who have ever been screened)</td>
<td>I = women 40-82 years old; Sample was divided into 2 groups: current users (mammogram &lt; 2 years) and overdue (mammogram &gt; 2 years)</td>
<td>Population-based survey</td>
<td>Data: 50% of women had mammogram within the past year, 32.2% within the past 2 years, and 17% within more than 2 years. 73% of women reported CBE within the past year. Barriers: Women who were overdue were more likely to describe themselves as following the Indian way of life, to seek guidance from a traditional healer, and to attend spiritual ceremonies. More traditional women were less likely to have a mammogram in the future. Women who were on schedule were less likely to describe themselves as traditional. Women who described themselves as more traditional and who grew up in a home where a tribal language was spoken were less likely to be up to date with CBE. Women who sought guidance from a traditional healer were less likely to be screened. Intentionality had a significant influence on whether women would continue to get screened. Poor women were more likely to use traditional healers.</td>
</tr>
<tr>
<td>Eberth, Huber, and Rene (2010)</td>
<td>California</td>
<td>Ab abstracted from the 2003 California Health Interview Survey (CHIS) N = 882 American Indians and Alaska Natives (AI/AN) alone, N = 477 aged 18 years and older, and N = 253 aged 40 years or older</td>
<td>I = women who reported AI/AN race alone. Two groups: 18 years and older and 40 years and older</td>
<td>Population-based cross-sectional survey</td>
<td>Data: AI/AN women had lower screening rates than Black, White, and combined races. Age, education, Pap test practices, and doctor's visit in the past year associated with CBE. Facilitators: Age more than 60 years, had a Pap test in the past 3 years, and were high school graduates or attended some college increased likelihood of mammogram within the past 2 years. Doctor's recommendation: increased likelihood of screening; also if a doctor refers them directly to a screening facility or they can be screened that same day, they were more likely to get screened. Possible barriers: AI/AN women may have a false sense of security regarding need for screening due to lower breast cancer rate. Other factors to consider: geographic isolation, language barrier, lack of insurance, transportation and child care, and traditional and cultural issues</td>
</tr>
<tr>
<td>Gonzales, Harding, Lambert, Fu, and Henderson (2013)</td>
<td>Four tribally administered health care facilities located on Indian reservations in the Northwest region of the United States.</td>
<td>N = 200 AI women from 4 tribally administered facilities on reservations</td>
<td>I = 18 years and older, diagnosed with diabetes mellitus for at least 1 year, classified as an active patient, and living within the facility's service area. Not clear how many women were 40 years and older; however, 74% of the women were reported to be 50 years and older</td>
<td>Cross-sectional survey with 3 outcome variables: CBE within the past year and mammogram and Pap test within past year or longer. Categorized as current (within past year) or not current—never had or had it more than 3 years ago for aged 40-49 years; more than 1 year ago for those aged 50 years and older. Also used a multilevel measure of perceived discrimination (PD) dichotomized as any or never. If subjects answered yes to PD, they were asked questions about health-seeking behavior.</td>
<td>Data: Most subjects were middle-aged, having completed high school or less, and unemployed. All had Indian Health Service (IHS) insurance; 77% had additional insurance—45% not current for mammogram, 58% not current for CBE. Barriers: Insurance through IHS was only associated with not being current with mammogram and CBE. As mean level of PD increased, the number of suboptimal health-seeking behaviors increased. After adjustment, no longer significant</td>
</tr>
</tbody>
</table>

(continued)
### Table 1. (continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Location/Setting</th>
<th>Sample</th>
<th>Inclusion (I)/Exclusion (E) criteria</th>
<th>Intervention/Data Collection Methods/ Theory</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nuño et al. (2012)</td>
<td>Arizona and New Mexico</td>
<td>Data abstracted from Behavioral Risk Factor Surveillance System (BRFSS) from 2006 and 2008, N = 10,691; 24% were Hispanics (n = 2,565), 7% were AI (n = 748)</td>
<td>I = women older than 40 years</td>
<td>Cross-sectional survey Outcome variables: ever had a mammogram or had one in the past year? Also looked at rarely screened women — no mammogram in past 5 years</td>
<td>Data: 60% of rural women had a mammogram in the past year; 65% were urban women. More rural women were rarely screened (9%), than urban rarely screened (5%). Among AI women, more rural women had mammograms than urban women (not significant). Rural AI women less likely to have mammogram than urban AI women. Facilitator for urban AI women: insured (other than IHS); this was not seen in rural women. Facilitator for rural women: the National Breast and Cervical Cancer Early Detection Program and the IHS. Barrier: Urban women for whom cost was an issue had lower screening rates. For rural women, the barriers were cost, lack of insurance, and lack of a usual provider.</td>
</tr>
<tr>
<td>Schumacher et al. (2008)</td>
<td>Alaska, Arizona, and New Mexico</td>
<td>Screening data abstracted from Education and Research Toward Health (EARTH) study, N = 3,558 (women 40 years and older)</td>
<td>I = must be eligible for IHS services, older than 18 years; able to read and understand the survey E = pregnant, being treated for cancer, and women with unknown timing of the last mammogram</td>
<td>Cross-sectional survey on health, lifestyle, physical activity, diet history, and medical tests Outcome variables: mammogram within past 2 years or not for women aged 40 years and older</td>
<td>Data: 64.6% of Alaskan women and 44% in the Southwest reported mammograms in the past 2 years. In the Southwest, 30.1% had never been screened. Older = more likely to be screened. Alaskans = more likely to be screened. AN = more likely to be screened than Navajo women from the Southwest. Breast cancer mortality is higher in Alaska. Facilitators: more education, positive family history, and higher income. Urban residents were more likely to screen. Screening was more likely among people with other chronic conditions due to more frequent contact with doctors.</td>
</tr>
<tr>
<td>Simonds, Colditz, Rudd, and Sequist (2011)</td>
<td>California</td>
<td>Data abstracted from the 2001, 2003, and 2005 CHIS, N = 891 women aged 40 years and older</td>
<td>I = all respondents who self-identify as AI/AN or AI primary race</td>
<td>Cross-sectional survey Outcome variables: self-reported receipt of mammogram within/prior to 2 years for women 40 years and older. Also assessed for PD</td>
<td>Data: adherence to mammogram screening in the past 2 years = 69.1%. In urban areas, access to IHS services resulted in lower screening in rural areas, access to IHS resulted in higher screening. The IHS is most important in more rural settings where women are more isolated. Facilitators: having insurance and a recent doctor’s visit. Barriers: never married and self-report of PD.</td>
</tr>
<tr>
<td>Tolma et al. (2014)</td>
<td>Oklahoma—tribal clinics</td>
<td>Random sample, recruited in 2 waves. First 162 women recruited in 2005-2006, Second wave = 93 women recruited in 2011-2012</td>
<td>I = Subjects due for their next mammogram in 6 months and age 40-66 years</td>
<td>Cross-sectional survey Outcome variable: when was the last mammogram—dichotomized into 2 groups = mammogram within the past 2 years and 3 years or more and not regular. Also looked at attitude scores, self-efficacy, fatalism, susceptibility, cultural affiliation, and AI women’s beliefs about their role in current AI society</td>
<td>Data: ranged in age from 40 to 60 years, 65% screened within the past 2 years. Screening regularity was related to doctor’s influence, increased knowledge, family history, and more frequent CBE. Facilitators: higher income, employment, having had a recent CBE, having a doctor, and insurance and family history of breast cancer. Barriers: more cultural affiliation, higher fatalism, and higher perceived control barrier scores.</td>
</tr>
</tbody>
</table>

(continued)
Wilson et al. (2011) IHS clinics in Montana and Wyoming

AI women aged 18 years and older on 6 reservations (had at least 2 clinic visits excluding emergency room use during a 78-month period). Sample = 1,094 women aged 18 years and older and 700 women aged 45 years and older

I = women 45 years and older for the breast cancer arm of the study

Intervention/Data Collection Methods/Theory

Chart review and review of electronic records

Data: mean age = 60.5. 31.6% had a blood quantum of 50% or more. 37.7% had a mammogram within the 3-year study period. 8% had an abnormal result. 82.2% of the mammograms were screening. Among women with a prior abnormal mammogram, 58.7% were screened within a 3-year period.

Facilitators: Screening prevalence was higher for those women with blood quantum over 50%, those who received care from hospitals, those with more visits, and those living in a town with a mammogram facility. For those with previous abnormal screen, those living in town with a mammography facility were more likely to have a mammogram.

Barriers: Distance to screening facility was not significant for primary screening but was significant for secondary screening. IHS screening results were similar to that in Medicaid populations. For those with prior abnormal screenings, more than 40% are not receiving annual follow-up. Referral rates were low.

Daley, Filippi, et al. (2012)

Kansas and Missouri Indian Health Service office, tribal clinics, and urban safety net clinics

N = 13 community leaders and 17 providers

I = anyone employed in the clinic nonspecific

Semistructured individual interviews

Free-listed technique

Community leaders barriers: fear, access, embarrassment, education, and awareness

Providers barriers: education and access

Similarities: prevention not emphasized, cost and transportation issues, education that is culturally tailored, and literacy level that is appropriate.

Differences:

Leaders: opportunistic screening; provide screening and education at the same time

Providers: low awareness among health care staff, poor follow-up adherence, lack of specific mammogram site, and wait time can be several months due to busy clinic

Seven themes emerged from an up-to-date group:

1. Have had an experience with breast cancer
2. Knowledge—comfortable but not how to do breast self-examination
3. Other health issues take priority in the community
4. Barriers: cost, no insurance, location, accessibility, different priorities, and negative exp. With mammograms
5. Provider recommendation but lack adequacy of sharing results
6. Education—use breast models and go door to door
7. Provide free mammogram and decrease discomfort

Six themes from a not-up-to-date group:

1. Uncomfortable with knowledge level
2. Barriers: insurance, transportation, trust, fear, and negative experience. Other priorities take precedence.
3. Were told to get them but chose not to
4. Lack of respect and understanding of culture
5. Time as a barrier
6. Suggested interventions: free mammograms, cultural tailoring, and buddy system


Kansas and Missouri Urban areas and reservations

N = 84 American Indian (AI) women

I = women older than 40 years

10 focus groups (self-report—7 up to date with mammography and 3 not up to date)

Seventeen themes emerged from an up-to-date group:

1. Have had an experience with breast cancer
2. Knowledge—comfortable but not how to do breast self-examination
3. Other health issues take priority in the community
4. Barriers: cost, no insurance, location, accessibility, different priorities, and negative exp. With mammograms
5. Provider recommendation but lack adequacy of sharing results
6. Education—use breast models and go door to door
7. Provide free mammogram and decrease discomfort

Six themes from a not-up-to-date group:

1. Uncomfortable with knowledge level
2. Barriers: insurance, transportation, trust, fear, and negative experience. Other priorities take precedence.
3. Were told to get them but chose not to
4. Lack of respect and understanding of culture
5. Time as a barrier
6. Suggested interventions: free mammograms, cultural tailoring, and buddy system

(continued)
Table 1. (continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Location/Setting</th>
<th>Sample</th>
<th>Inclusion (I)/Exclusion (E) criteria</th>
<th>Intervention/Data Collection Methods/ Theory</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Filippi et al. (2013)</td>
<td>Kansas and Missouri urban areas and reservations</td>
<td>N = 48 AI women</td>
<td>I = women aged 40 years and younger E = not discussed</td>
<td>Five focus groups (44 women) Four interviews/Community-based participatory research</td>
<td>1. Personal experience and family history. Or not knowing how to do breast self-examination 2. Education in simple language 3. Education sources 4. Lack of education about resources 5. Barriers: competing priorities, cost, insurance, transportation, location, and fear 6. Mammogram referrals and locations 7. Embarrassment and lack of priority 8. Vital to health of community 9. Need to build in a social component</td>
</tr>
<tr>
<td>Filippi et al. (2013)</td>
<td>Kansas and Missouri urban areas and reservations</td>
<td>N = 48 AI women</td>
<td>I = women aged 40 years and younger E = not discussed</td>
<td>Five focus groups (44 women) Four interviews/Community-based participatory research</td>
<td>1. Personal experience and family history. Or not knowing how to do breast self-examination 2. Education in simple language 3. Education sources 4. Lack of education about resources 5. Barriers: competing priorities, cost, insurance, transportation, location, and fear 6. Mammogram referrals and locations 7. Embarrassment and lack of priority 8. Vital to health of community 9. Need to build in a social component</td>
</tr>
<tr>
<td>James, Gold, St. John-BlackBird, and Trinidad (2015)</td>
<td>Washington State: rural and urban sites</td>
<td>N = 12 tribal staff and 33 American Indian/Alaska Native (AI/AN) women</td>
<td>I = National Breast and Cervical Cancer Early Detection Program staff or AI/AN women 50 years or older</td>
<td>Staff: phone individual interviews Women: four focus group interviews/precede-proceed framework</td>
<td>1. National Breast and Cervical Cancer Early Detection Program staff or AI/AN women 50 years or older 2. Predisposing factors: financial, access, and comfort zone 3. Enabling factors: financial, program, access, and comfort zone 4. Reinforcing factors: program, access, comfort zone Each set of factors then divided into positive and negative influences</td>
</tr>
<tr>
<td>Ndikum-Moffor, Brauca, Daley, Gajewski, and Engelman (2013)</td>
<td>Kansas and Missouri urban areas and reservations</td>
<td>N = 53 AI/AN women</td>
<td>I = AI/AN women; 40 years or older; no history of breast cancer diagnosis, lumpectomy, mastectomy, or radiation; and had a mammogram within the past 5 years</td>
<td>Nine focus groups</td>
<td>1. Knowledge, communication, and awareness 2. Barriers to getting mammograms 3. Facility size 4. Impression of technician 5. Motivation to get a mammogram</td>
</tr>
<tr>
<td>Watson-Johnson et al. (2011)</td>
<td>Atlanta, Phoenix, Pittsburgh, Los Angeles, and Seattle: professional facilities except for those conducted with AI/AN women interviewed at an urban Indian health organization</td>
<td>N = 128 women (not clear how many were AI/AN)</td>
<td>I = women aged 43-75 years; had 2 or more screening mammograms in the past 5 years but have not been screened within the past 18 months. E = woman who had a mammogram before age 40; a mammogram that required follow-up testing; or a previous diagnosis of breast cancer</td>
<td>20 focus groups (2 had AI/AN women)</td>
<td>Barriers: 1. Concern about test efficacy 2. Personal concerns about the procedure 3. Access to mammograms 4. Psychosocial issues 5. Cultural factors</td>
</tr>
<tr>
<td>Study</td>
<td>Location/Setting</td>
<td>Sample</td>
<td>Inclusion (I)/Exclusion (E) criteria</td>
<td>Intervention/Data Collection Methods/ Theory</td>
<td>Findings</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------</td>
<td>--------</td>
<td>--------------------------------------</td>
<td>---------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Chilton et al. (2013)</td>
<td>Southeast Texas/ University of Texas, MD Anderson Cancer Center</td>
<td>37 AI women 36 to 69 years (52.0 mean)</td>
<td>I = all self-reported Native Americans</td>
<td>Community-based participatory research. Included 2 separate 1-day events less than a year apart (2009, 2010). Surveys given at the beginning and at the end of the intervention. Intervention: 1-day event with free screening, breast cancer prevention education, education on new types of physical exercise and stress reduction; an art component and a nutrition component using Native foods, and a cooking demonstration. Included questions about breast health and breast cancer and screening. Women listened to an American Indian breast cancer survivor recount her story of diagnosis and treatment.</td>
<td>Data: 80% of those who ever had a mammogram; 76.7% screened over the past 2 years. Posttest indicated understanding of the need for early detection (p = .043). Number believing that finding and treating breast cancer can save a life increased (45.9% [17/37] over the past 2 years. Posttest indicated understanding of the need for early detection (p = .238). The women learned that breast cancer can be detected early and that either rising age or being childless can increase the risk of breast cancer. A majority expressed intention to get a mammogram regularly, and 91.9% (34/37) said that they would recommend to friends and family that they get mammograms.</td>
</tr>
<tr>
<td>Doorenbos, Jacobson, Corpuz, Forquera, and Buchwald (2011)</td>
<td>Washington/Seattle Indian Health Board, a multidisciplinary, community-based organization that provides health and social services to individuals from more than 200 tribes and other low-income residents living in the Pacific Northwest</td>
<td>5,633 patients seen at an urban clinic during the prior 2 years</td>
<td>I = All patients older than 18 years who accessed primary care, pharmacy, nutrition, and dental or behavioral health services at the Seattle Indian Health Board within the previous 2 years were eligible for the study. For breast cancer arm, women aged 40 years and older.</td>
<td>Randomized controlled cancer-screening trial. Calendar was sent to 5,633 patients. A calendar that included health messages was sent to n = 2,695. Calendar without messages was sent to n = 2,668. Follow-up via medical records for 15 months after a calendar was sent out to see if women received mammograms following receipt of the calendar and to assess whether receipt of calendar with health messages increased rate of screening.</td>
<td>Data: follow-up mammogram 13.6% control, 14.0% messages, p = .81 Follow-up manual breast exam 9.2% control, 11.3% messages, p = .19 The calendar with health messages did not result in increased receipt of any cancer-related prevention outcome compared with the calendar without health messages. Printed materials with health messages are likely too weak an intervention to produce the desired behavioral outcomes in cancer screening.</td>
</tr>
<tr>
<td>Katz, Kauffman, Tatum, and Paskett (2008)</td>
<td>Robeson County, North Carolina, women who participated in the Robeson County Outreach, Screening, and Education (ROSE) Project, a randomized controlled trial aimed at increasing mammography screening rates among medically underserved women</td>
<td>N=851 women; 323 AI; no mammogram in the past 12 months by medical record review</td>
<td>I = randomly selected female patients who were 40 years and older served by the major health care provider for the rural county</td>
<td>Intervention: an educational program delivered by a lay health advisor (cases). A physician letter and brochure about cervical cancer screening (control group). The intervention was tailored to the needs of each woman by addressing reported barriers (lack of insurance, time, encouragement, etc.) to obtaining a mammogram and was delivered during three home visits (intensive, face-to-face interactive education), phone calls, and tailored mailings over a 9- to 12-month time period. All women completed a baseline survey prior to randomization and a second survey 12 to 14 months following randomization.</td>
<td>Data: Almost two thirds of the women reported that they attended church at least once a week, and less than 4% were classified as having low spirituality. Church attendance (p = .299) or spirituality (p = .401) did not have a significant impact on mammography use. The results indicated that 42.5% of the women in the lay health advisor intervention group (n = 433), and 27.3% of those in the comparison group (n = 418) received a mammogram in the 12 months before the follow-up survey (relative risk = 1.56, 95% confidence interval = 1.29-1.87, p = .001). Women in the lay health advisor group compared with the women in the comparison group displayed better belief scores (p = .004) and reduced barriers (p = .001) to mammography at follow-up. Church attendance and spirituality did not impact mammography use.</td>
</tr>
</tbody>
</table>
Toward Health (EARTH) Study (Schumacher et al., 2008). The sample sizes of these studies ranged from 115 to 3,558 subjects.

The main outcome variable for four of these studies was mammogram within 2 years (Canales et al., 2007; Eberth et al., 2010; Schumacher et al., 2008; Simonds et al., 2011). Gonzales, Harding, Lambert, Fu, & Henderson (2013) utilized a cross-sectional survey with the outcome variables mammogram and clinical breast exam (CBE) within the past year. The sample for that study was 200 AI women aged 18 years and older, diagnosed with diabetes mellitus for at least 1 year, and classified as an active patient in one of four tribally administered facilities on reservations in the Northwest region of the United States. It was not clear how many of the women in the sample were 40 years of age or older; however, 74% of the women were reported to be 50 years and older. Subjects were characterized as current (mammogram within the past year) and not current (never screened or not screened within the past 3 years for those aged 40 to 49 years or past 1 year for those aged 50 years and older).

Tolma, Stoner, Li, Kim, and Engelman (2014) used a cross-sectional survey administered to a random sample of women receiving care at tribal clinics in Oklahoma. The survey was administered in two waves (2005-2006 and 2011-2012) and included women 40 and 66 years of age and due for their next mammogram in 6 months. In addition to collecting information on mammography, this study examined self-efficacy, fatalism, susceptibility, cultural affiliation, and beliefs about AI women’s role in current AI society.

Wilson et al. (2011) not only used chart review to evaluate screening rates at IHS clinics in Montana and Wyoming but also collected data on women’s blood quantum, defined by Thornton (2008) as the level of AI “blood” that an individual who reports his or her race as AI could claim, based on tracing ancestry back through time to a relative or relatives identified as full-blooded AI on a tribal census. The level of blood quantum, defined as none, less than 50%, or more than or equal to 50%, appears to be used as a means of determining the level of Indian ancestry that can be claimed by each participant, or perhaps as a means of rooting out any participant who is not truly Indian “by blood”. Subjects were 18 years of age and older (45 years and older for the breast cancer arm of the study) from six reservations who had at least two clinic visits within the past 78 months.

Breast Cancer Screening Barriers

Consistent with other low-income populations (Jerome-D’Emilia, 2015), socioeconomic factors such as lack of insurance, lower income and less education, inadequate access to care, and the absence of a usual source of care were related to lower rates of screening in the AI/AN population. While this population is unique, in that services are available through the IHS to eligible members of the AI/AN population, those who had insurance (typically Medicaid), in addition to IHS eligibility, were more likely to be screened (Gonzales et al., 2013). Simonds et al. (2011) found that in rural areas proximity to an IHS facility was consistent with higher screening rates, while in urban areas IHS access was associated with lower screening rates. The authors concluded that the IHS is more important in rural areas where women are more likely to be isolated from other mammogram facilities. Simonds et al. (2011) also examined perceived discrimination (PD). Women who reported PD within a health care setting were less likely to be screened.

Gonzales et al. (2013) found that women who were reliant on IHS services (lacking any other source of insurance) were less likely to be current with mammogram and CBE. This study used a multi-item measure of PD and dichotomized responses as ever experienced any PD, or never experienced PD. Those women who reported experiencing PD were then asked about health-seeking behavior. As the mean level of PD increased, the level of suboptimal health-seeking behaviors (did not follow doctor’s advice or treatment plan for example) increased. A woman’s perception of discrimination was also associated with not being current with CBE or mammogram, although after adjusting for potential confounding variables the association was no longer significant.

Nuño et al. (2012) addressed socioeconomic issues in a study that included AI women who resided in rural and urban areas. This study found that overall AI women living in rural settings were less likely to have been screened when compared with AI women residing in urban areas. Even after adjusting for various socioeconomic factors such as insurance, a regular source of care, education, and income, rural AI women remained less likely to have had a mammogram. A higher percentage of rural women (9%) were categorized as rarely screened (defined as no mammogram within the previous 5 years) when compared with urban women (5%). These authors suggested that for rural women access to a tribal arm of the National Breast and Cervical Cancer Early Detection Program and the presence of IHS facilities on reservations were factors in determining whether or not rural women would be screened.

Eberth et al. (2010) compared AI/AN women (self-report as only race) with African American, White, and combined-race women. For the AI/AN women aged 40 years and older, screening levels were significantly lower than for White, African American, and other races combined. The authors suggest that barriers noted specifically for AI/AN women in this study included geographic isolation, language barriers, lack of transportation and child care, and traditional and cultural issues.

Canales et al. (2007) examined “traditionality” with a 13-item scale that predicted a woman’s place on a continuum according to cultural beliefs, customs, and health practices. Women who could be seen as more traditional, defining themselves as living an “Indian way of life,” were less likely to be current with screening, when compared with women who were seen as less traditional based on the continuum of
traditionality. Some behaviors consistent with living (a more traditional) “Indian way of life” included utilizing the services of a traditional healer and attending spiritual ceremonies. These women were also more likely to have been raised in a home where a tribal language was spoken. Low-income AI/AN women were also more likely to seek care from traditional healers, and therefore, it was found that they were less likely to consider screening in the future. Tolma et al. (2014) found that a higher level of cultural affiliation was a barrier to screening. This is consistent with the studies that found that a more traditional upbringing and way of life was associated with a decreased adherence to screening. That study also found that fatalism was a barrier to screening. Fatalism has frequently been associated with a lower likelihood of screening in racial and ethnic minority women (De Jesus & Miller, 2015; Lee, 2015; Vrinten, Wardle, & Marlow, 2016).

Breast Cancer Screening Facilitators

Factors that would facilitate screening for AI/AN women included a physician’s recommendation, specifically if the physician made a referral for a certain facility, or if the woman could be screened the same day she received the recommendation (Eberth et al., 2010). Indeed such factors as having a higher income, more education, a usual source of care and insurance, and having had a recent physician’s visit have been found to be facilitators in most if not all races and ethnicities of women, including AI/AN women (Gonzales et al., 2013; Jerome-D’Emilia, 2015; Kempe, Larson, Shetterley, & Wilkonson, 2013; Nuño et al., 2012; Simonds et al., 2011; Tolma et al., 2014). Tolma et al. (2014) also found that family history was a facilitator for screening. Schumacher et al. (2008) found that urban residence was associated with screening, as was having a positive family history. Eberth et al. (2010) and Schumacher et al. (2008) found that a women’s age influenced screening likelihood (older age was associated with a greater likelihood of screening). These researchers found that women in Alaska were more likely to be screened than were the Southwestern Navajo women, but they did state that breast cancer mortality is higher in Alaska. These researchers did suggest that AI/AN women, in general, may have a false sense of security about screening due to the lower incidence of breast cancer in this population, and this may contribute to the general lower rate of screening found in this population.

Wilson et al. (2011) examined the association between blood quantum and breast screening and found that screening prevalence was higher for those women with a blood quantum more than 50% (i.e., having a higher level of Indian ancestry), those who lived in a town with a mammogram facility, those who received care from hospitals, and those with more clinic visits. Wilson et al. also suggested that IHS screening rates were similar to those found in Medicaid populations. They found that for those women with abnormal screening mammograms, more than 40% were not adherent to an annual screening schedule.

Qualitative Studies

The seven qualitative studies (Table 1) reviewed described themes that addressed barriers and/or facilitators, perceptions and experiences, satisfaction, adherence, and motivational factors related to breast cancer screening. Some of the researchers used focus groups to elicit information, while others used semistructured interviews to gain insight when speaking to women individually. The majority of studies were conducted with AI women; however, two of the studies also interviewed staff, providers, or tribal leaders.

Daley, Filippi, et al. (2012) used semistructured interviews with 30 providers and community leaders who interacted with AI women from their communities using a “free-listed” technique. This technique, when used in ethnographic studies, asks participants to define a cultural domain by listing aspects of that domain (Yeh et al., 2014). Using the free listing technique focusing on barriers, the leading four factors reported were fear, access, education, and embarrassment. Cost and transportation were additional barriers identified. Both groups also identified similar needs, including providing culturally appropriate mammography education, using Native elders in patient navigator roles, and emphasizing a need for more affordable preventive care (Daley, Filippi, et al., 2012).

In another study, Daley, Kraemer-Diaz, et al. (2012) used 10 focus groups representing 38 tribal affiliations of AI women who were either up to date ($n = 66$) or not up to date ($n = 18$) with breast cancer screening to identify barriers and potential interventions to improve screening rates. Of those women in the up-to-date group, several themes were apparent. Having had experience with breast cancer or knowing someone who was diagnosed and having an understanding of breast cancer and treatments were factors that would encourage screening. It was noted that some AI women did not view breast cancer as important when compared with other health issues, and several barriers existed such as cost, location, lack of insurance, accessibility, time constraints and different priorities, fear of mammography and possible test results, privacy, and previous negative experiences with mammography (Daley, Kraemer-Diaz, et al., 2012). In the not up-to-date group, women reported some knowledge of breast cancer but had many unanswered questions. They reported similar barriers as the other group; however, they also reported that other priorities came before preventive care, past negative experiences with the medical system affected their decision, and other mistrust issues.

Suggested interventions for improving screening rates in the up-to-date group included providing education to all women using door-to-door visits, free or low-cost mammograms, and developing “pain-free” mammography. In the focus groups of women considered not up to date, participants
expressed a need for cultural tailoring of education, employer wellness programs, and a “buddy system” as a means for support and a method to potentially decrease mistrust.

Perceptions and experiences with breast cancer screening were described by 33 AI/AN women who participated in four focus groups and by 12 staff who were interviewed over the phone (James et al., 2015). The researchers used the PRECEDE–PROCEED framework when identifying two sets of semistructured interview questions to be used, one for the women and one for the staff. The questions focused on three types of factors: predisposing, enabling, and reinforcing associated with this model. Data were transcribed and coded and axial and subcodes were established. Predisposing factors identified included having knowledge that breast cancer was prevalent in their community, having had experience of breast cancer with a loved one, and having faith in God. Negative influencing factors identified included cost, time away from daily activities, and fear of bad news. Enabling factors that positively influenced screening included mobile mammography and incentives to ensure adherence. Caring for others, transportation issues, cost, and weather or road conditions were mentioned by women as negative factors.

Experience and satisfaction with breast cancer screening was discussed by Ndikum-Moffor, Braiuca, Daley, Gajewski, & Engelman (2013) following their nine focus groups of AI/AN women. Seven themes emerged including three that were similar to findings from Daley, Kraemer-Diaz, et al. (2012) and James et al. (2015). The themes identified were knowledge, communication and awareness, barriers, and motivation. Additional themes found in this study included mammogram facility size (women reported having had better experiences in smaller centers compared with larger centers) and impressions of the mammogram technologist (positive vs. negative experiences influenced satisfaction). Finally, suggestions on how to improve breast cancer screening adherence were similar to other studies, such as improved education, caring and competent technicians, using warming techniques in rooms, and creating better mammogram machines.

Watson-Johnson et al. (2011) addressed the concept of adherence through discussions with 20 focus groups, with two of the focus groups including only AI/AN women. The researchers combined all the responses to identify five barriers. Personal concerns about the procedure and access to mammography were similar to themes reported in other studies (Daley, Filippi, et al., 2012; James et al., 2015; Ndikum-Moffor et al., 2013). Psychosocial issues including fear of a diagnosis, low personal risk, and embarrassment were identified, and members of the AI/AN focus group specifically mentioned receiving poor treatment from technicians. Two factors were identified in this study only: “manifest destiny” meaning that “breast cancer can develop from talking, thinking, and worrying about it” (Watson-Johnson et al., 2011, p. 1890) and a concern about test efficacy (identifying false positives for example).

Filippi et al. (2013) interviewed women younger than 40 years to gain insight into their beliefs and behaviors about screening mammograms. Forty four women participated in five focus groups, and four women were interviewed separately. Most of the women interviewed in the study knew about breast cancer and knew a woman diagnosed with the disease; however, they did not know about screening or breast cancer risk. Themes related to the following topics were identified: knowledge, barriers, suggestions to improve access, and perceptions and use of the health care system. Cost was noted to be a barrier, but finding the time to get screened was a major barrier and made it difficult for the women to make their own health a priority in relation to work, family obligations, and child care responsibilities. When faced with another family member’s needs, some women were likely to ignore their own health concerns.

Using the theory of planned behavior, Tolma et al. (2012) identified motivational factors affecting an AI woman’s decision to obtain a mammogram. Using a semistructured interview guide, 24 women from 8 tribes (majority from the Citizen Potawatomi Tribe) were interviewed, and themes and key ideas emerged that were identified as aspects of the theory of planned behavior. Some of these themes/key ideas included mixed attitudes (including fear and embarrassment but also early detection), subjective norms (women who get mammograms know other women who get mammograms), perceived behavioral control barriers (difficulties due to scheduling, transportation, and language barriers), self-efficacy (rating aspects of the mammogram experience in terms of difficulty level), and negative attitude (associating breast cancer with death, pain, and suffering). One woman stated that AI were more susceptible to diseases because of the “Indian in us.” Women also discussed the role of the woman in AI culture and expressed the belief that the woman is the leader of the family, the one who holds the family together (Tolma et al., 2012).

**Intervention Studies**

This systematic review revealed that there were very few intervention studies focused on breast cancer screening among AI women. The three intervention studies (Table 1) included were geographically dispersed with sites in Texas, North Carolina, and Washington. The sample sizes ranged from 37 to 323 AI women in projects taking 12 to 15 months. The interventions varied greatly in approach, with only one study providing an actual screening (Chilton et al., 2013). All three studies included breast cancer prevention education, one with the educational program delivered by a lay health advisor (Katz, Kauffman, Tatum, & Paskett, 2008) and another with calendar messaging (Doorenbos, Jacobsen, Corpuz, Forquera, & Buchwald, 2011). Reported barriers included lack of insurance, time, and encouragement (Katz et al., 2008). One study included posttests, which indicated an increased understanding of the need for early detection.
and that either rising age or being childless can increase the risk of breast cancer (Chilton et al., 2013).

Doorenbos et al. (2011) recruited patients treated at a multidisciplinary community-based clinic, which treats individuals from more than 200 tribes and other low-income residents in the Pacific Northwest. This intervention was an attempt to evaluate the effect of targeted health messaging sent to individual patients in the form of a calendar. A control group received a calendar without preventive health messaging. Researchers then followed up via medical record review for 15 months. This study had a sample of 5,633 subjects, including a control group of 2,668 (708 women aged 40 years and older) and an experimental group of 2,695 (722 women aged 40 years old and older). The calendar with health messages did not result in increased receipt of any cancer-related prevention outcomes compared with the calendar without health messages (Doorenbos et al., 2011).

The third intervention study, based in North Carolina, was an outgrowth of the Robeson County Outreach, Screening, and Education (ROSE) Project, an outreach program developed in coordination with a major health care provider in a rural community. For this study, Katz et al. (2008) used a case control design that involved an educational program provided by a lay health advisor for the cases and a brochure and physician letter sent to the controls. The sample was a random selection of women who received services through this rural provider and who had not been screened in the past year. Of the total sample of 851 women, 323 self-identified as AI. Women in the lay health advisor group compared with the women in the comparison group (i.e., those who received a physician letter and brochure about cervical cancer screening) displayed better belief scores and reduced barriers to mammography at follow-up (Katz et al., 2008). The researchers did not define these results by racial/ethnic group. This study also evaluated church attendance and spirituality for possible associations with mammogram use and found no association between church attendance or spirituality and mammography use among AI women.

**Discussion**

Low-income women are more likely to be diagnosed at a later stage and to die from breast cancer when compared with high-income women (Gathirua-Mwangi et al., 2015). Socioeconomic disparities such as lack of insurance and a usual source of care have been implicated in the barriers that make access to breast cancer screening difficult to achieve (DeSantis, Naishadham, & Jemal, 2013). Studies of low-income minority women in the United States tend to identify the same factors as causes of disparity—cost, lack of a usual source of care or a physician recommendation, lack of insurance, and structural barriers such as distance from a screening facility and a lack of transportation (Jerome-D’Emilia, 2015; Third, Diamant, Hoq, & Maly, 2009). Our goal in this review was to determine if similar barriers would be found in the AI/AN population, and indeed, we did find evidence that socioeconomic and structural barriers impede access to mammography for AI/AN women (Eberth et al., 2010; Nuño et al., 2012; Simonds et al., 2012; Tolma et al., 2014).

Compounding these barriers, AI/AN women expressed the belief that preventive care is not a priority, especially when it is their own preventive care. Filippi et al. (2013) conducted focus groups and interviews in which AI women reported that spending money on a mammogram (for those women who lack health insurance or access to IHS services) would not be a priority when compared with paying household bills and other financial responsibilities. These women also believed that because they had to find the time to get screened, perhaps taking time from work or child care, was another reason why their health needs were a priority. The lack of self-attention seen in AI/AN women is likely to prevent them from taking care of themselves and participating in preventive care so as to meet the needs of their children and families (Filippi et al., 2013).

Daley, Kraemer-Diaz, et al. (2012) also noted that women who were not up to date with mammography prioritized preventive care differently. It is likely that the idea of preventing a disease that has a low chance of occurring is not seen as important when comparing with treating a disease that is seen as relatively common. Some women discussed the prioritizing of health issues in this way: the most pressing would be acute medical care (particularly care received at the IHS); next in terms of importance would be medical care of other family members and nonmedical priorities such as caring for children and the home. One woman stated,

> I’m busy and I don’t have time for myself, like most women. We don’t ever have time for ourselves. We give 150% to our families, to our jobs, to our friends and then we forget about ourselves until we get sick. (Daley, Kraemer-Diaz, et al., 2012, p. S37)

In general, women living in poverty tend to have social networks that are comparatively small and include primarily other, equally poor, individuals (Moskowitz, Vittinghoff, & Schmidt, 2013). The lack of a support system, and the limited resources associated with poverty and rural residence, may leave women with a limited ability with which to navigate the health care system effectively. This can further impede women from seeking preventive care. In addition to the lack of time for self-care and the need to take care of their families’ needs, the idea that breast cancer was not as important as other health issues reflects the difficulty women may face in prioritizing preventive care.

Some barriers that were identified are likely to be unique to the AI/AN population. Watson-Johnson et al. (2011) reported that more than one woman expressed concern with “manifest destiny,” defined as the assumption that just
thinking or talking about breast cancer can cause the disease to develop, which may be seen as a lack of understanding or a mistrust of medical care. Tolma et al. (2012) reported that one woman suggested that “being Indian” may increase susceptibility to breast cancer, while Eberth et al. (2010) suggested that AI women may be hesitant to undergo screening because they believe that their risk is low. Some women also expressed a feeling of mistrust of the technology of screening or of the technicians who provide screening services (Watson-Johnson et al., 2011). The perception of discrimination in the health care system may be a cause of this mistrust. Furthermore, the reliance on traditional healing, language dissonance, social and geographic isolation, and PD within the health care system are all factors that may decrease screening adherence in the AI/AN population.

Reliance on the IHS is another factor that is unique to the AI/AN population. While the existence of a form of nationalized health care can be seen as a positive factor, the IHS has been chronically underfunded, which likely is a cause of the health disparities we have seen in the AI/AN population (Warne & Frizzell, 2014). A report by the Office of the Inspector General in 2016 found that while IHS facilities are providing care to increasing numbers of AIs/ANs, the facilities remain underfunded, and this by necessity results in a limited scope of services and limited access to specialist physicians (UDHHS, 2016; Warne & Frizzell, 2014), which can affect screening, diagnosis, and treatment of breast cancer in the IHS system. Furthermore, while the existence of the IHS has an impact on access to care specifically for the AI/AN populations residing in underserved and geographically isolated rural area, it must be noted that the IHS is a provider of care and not an insurance carrier. Mammography services may not be available at every IHS facility, and when services are not available on site, they are provided to eligible patients through contracted care. If funds run out by the end of the fiscal year, mammography services might not be available, unless the woman requiring screening has additional insurance such as Medicaid (Boccuti, Swoope, & Artiga, 2014; Dakota & Dakota, 2017).

Limitations

Several limitations exist when integrative reviews are completed. First, although an extensive literature search is undertaken, there are articles that may not present in the search based on the search terms used. Second, there may be local screening practices underway that are not documented in the literature. Studies may be difficult to analyze and compare directly with other studies depending on definitions and types of studies, that is, quantitative versus qualitative. There has been limited research in this population, particularly with respect to breast cancer screening, and so we had to include studies that were dispersed geographically and included diverse populations of women. The choice to include such studies may limit the generalizability of our findings.

There are some factors that make health disparities research in the AI/AN population unique when compared with other races and ethnicities. The likelihood of this population to reside on rural reservations and reliance on IHS eligibility for access to care can diminish researchers’ ability to gather accurate data on the AI/AN population, especially given the relatively lower incidence of breast cancer in this group. Analyzing data for AI/AN women can be problematic in that racial and ethnic minority individuals tend to be underrepresented in cancer registries; this is often related to racial misclassification, which for the AI/AN population may be very high (Roen, Copeland, Pinagtore, Meza, & Soliman, 2014). Additionally, incidence rates for AI/AN women may be less stable than for other racial/ethnic groups, due to the limited geographic areas in which their populations occur in high enough rates to aggregate data (Wingo et al., 2008). In most other parts of the United States, the AI/AN population may be so low that cancer incidence is not included or not accurately reported in registries.

An additional factor, which was demonstrated in the studies examined in this review, is that while there is a great deal of diversity in the AI/AN population, many studies aggregate or “lump” members of various tribes located in very different parts of the United States with diverse cultural traditions and histories into one circumscribed group. As Miranda, Tarraf, & González (2012) describe in the Latino population, this lumping is likely to mask important differences among tribes, thus leading to faulty analyses and incorrect conclusions. Tolma et al. (2012) emphasize the importance of conducting research on the AI/AN population at the local level due to the diversity of culture, history, and health behaviors that exist. Therefore, it can be misleading to compare studies taking place in widely different geographic locations and in populations with varied tribal connections. Tolma and colleagues recommend that researchers acknowledge the level of traditionality, defined as a connection to the AI identify, among subjects, and also pay attention to the possibility of unique cultural beliefs and behavioral norms related to health and health care when studying an AI/AN population, and especially when developing an intervention. However, even acknowledging these salient admonishments, the dearth of research in the area of breast cancer screening in AI/AN women required us to make some broad generalizations that should be tested in future tribe-specific studies.

Conclusion

AI/AN women appear to face many of the difficulties that other low-income minority women face in accessing preventive care, but they remain a unique population, with challenges and circumstances that are unlike those of other populations of women. This review has made clear that efforts to intervene with AI/AN women to increase breast cancer screening has been limited. The three intervention studies reviewed were not successful in improving screening
rates or adherence. The qualitative studies suggest that women may be more responsive to locally supportive, targeted, and culturally appropriate interventions that respect traditionality, yet encourage trust in the medical system. In that the current political environment in the United States may not be conducive to increasing financial support to the IHS, additional efforts to work with tribes in the development of interventions framed by community-based participatory research are needed to tackle the disparities in the AI/AN community.

Acknowledgments
The authors would like to thank Sydney Dougherty and Kayla Matteo, BS in Nursing students for their assistance with article retrieval.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iD
Patricia D. Suplee https://orcid.org/0000-0003-2055-1160

References


The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iD
Patricia D. Suplee https://orcid.org/0000-0003-2055-1160


rates or adherence. The qualitative studies suggest that women may be more responsive to locally supportive, targeted, and culturally appropriate interventions that respect traditionality, yet encourage trust in the medical system. In that the current political environment in the United States may not be conducive to increasing financial support to the IHS, additional efforts to work with tribes in the development of interventions framed by community-based participatory research are needed to tackle the disparities in the AI/AN community.

Acknowledgments
The authors would like to thank Sydney Dougherty and Kayla Matteo, BS in Nursing students for their assistance with article retrieval.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The authors received no financial support for the research, authorship, and/or publication of this article.

ORCID iD
Patricia D. Suplee https://orcid.org/0000-0003-2055-1160


