


# Barriers to Acupuncture Use Among Breast Cancer Survivors: A Cross-Sectional Analysis

Integrative Cancer Therapies  
2018, Vol. 17(3) 854–859  
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DOI: 10.1177/1534735418754309  
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## Abstract

**Introduction:** Increasing evidence suggests that acupuncture may be helpful to manage common symptoms and treatment side effects among breast cancer (BC) survivors. Acupuncture usage among BC survivors remains low with little known about the barriers to its utilization. We evaluated perceived barriers to acupuncture use among BC survivors and explored the sociodemographic variations of such barriers. **Methods:** We conducted a cross-sectional analysis at an urban academic cancer center on 593 postmenopausal women with a history of stage I-III hormone receptor-positive BC who were taking or had taken an aromatase inhibitor. We used the modified Attitudes and Beliefs about Complementary and Alternative Medicine instrument to evaluate patients' perceived barriers to acupuncture. Multiple linear regression analysis was performed to determine sociodemographic factors associated with perceived barrier scores. **Results:** The most common barriers were lack of knowledge about acupuncture (41.6%), concern for lack of insurance coverage (25.0%), cost (22.3%), and difficulty finding qualified acupuncturists (18.6%). Compared with whites, minority patients had higher perceived barriers to use acupuncture ( $\beta$  coefficient = 1.63, 95% confidence interval = 0.3-2.9,  $P = .013$ ). Patients with lower education had higher barriers to use acupuncture ( $\beta$  coefficient = 4.23, 95% confidence interval = 3.0-5.4,  $P < .001$ ) compared with patients with college education or above. **Conclusion:** Lack of knowledge and concerns for insurance coverage and cost are the common barriers to acupuncture use among BC survivors, especially among minority patients with lower education. Addressing these barriers may lead to more equitable access to acupuncture treatment for BC survivors from diverse backgrounds.

## Keywords

acupuncture use, barriers, breast cancer

Submitted July 31, 2017; revised December 1, 2017; accepted December 21, 2017

## Background

In 2017, it was estimated that there were more than 3.1 million breast cancer (BC) survivors in the United States.<sup>1</sup> This population often lives with long-term symptoms such as hot flashes, musculoskeletal pain, and chemotherapy-induced peripheral neuropathy.<sup>2</sup> BC patients have been shown to have higher usage of complementary and integrative medicine—the more recent term for a group of therapies previously known as complementary and alternative medicine (CAM)—compared with the general population.<sup>3</sup>

Between 48% and 83% of cancer patients have used CAM therapies.<sup>3-5</sup> Among these modalities, research indicates that acupuncture is helpful in the management of common side effects such as hot flashes, pain, anxiety, depression, and insomnia among BC survivors.<sup>2,6,7</sup> Acupuncture has also

been shown to be a safe medical procedure. The risk of severe adverse events such as pneumothorax, broken needles, and infection was found to be only 0.05 of every 10 000 treatments.<sup>8</sup> Out of 229 230 patients and more than 2.2 million acupuncture treatments, the risk of minor side effects such as bleeding and bruising was found to be 8.6%.<sup>9</sup>

Despite the high usage of CAM among BC patients and acupuncture's documented safety and efficacy,<sup>2,6,7</sup> acupuncture

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usage among BC survivors remains low. Although a single study showed that 31% of cancer patients used acupuncture,<sup>10</sup> multiple survey studies have found that its usage among BC survivors ranges from 1.7% to 4.9%.<sup>11-13</sup> Very little is known about the barriers that BC survivors face to utilize this treatment. Understanding these barriers may lead to increased patient access to acupuncture and other complementary therapies. To fill this knowledge gap, we performed a cross-sectional study to evaluate and identify sociodemographic factors associated with perceived barriers to acupuncture use among BC survivors.

## Methods

### *Study Design and Patient Population*

We conducted cross-sectional analysis drawing on participants from the follow-up assessment of Wellness after Breast Cancer (WABC), a longitudinal prospective study that focused on identifying biological determinants of symptom distress and disease outcomes in women with hormone receptor-positive BC taking aromatase inhibitors (AIs). Details of the study design have been published previously.<sup>14</sup> The institutional review board of the University of Pennsylvania approved the study protocol. The survey data used in the current analyses were collected between January 2014 and November 2015 at the outpatient BC clinics in an academic cancer center. Eligible participants were postmenopausal women with a history of stage I to III hormone receptor-positive BC who were current users of a third-generation AI for at least 6 months or who had discontinued AI use before the full duration of prescribed therapy. Trained research assistants approached potential study subjects in the waiting area of the oncology clinics. After obtaining written informed consent from participants, they gave them a self-report survey to complete while they waited. Of the original 613 participants in WABC who participated in the follow-up questionnaires, 20 were excluded from analysis because they did not answer the barriers to acupuncture use question, resulting in a sample size of 593.

### *Study Variables*

The primary outcome measure was the perceived barrier to acupuncture usage among BC survivors who were currently taking or had previously taken AIs. We measured perceived barriers by using the modified perceived barrier domain from the Attitudes and Beliefs about Complementary and Alternative Medicine (ABCAM) instrument.<sup>15</sup> The perceived barrier domain contains 10 questions about the reasons patients are unlikely or hesitant to use acupuncture, including “Acupuncture treatments are not based on scientific research,” “It may interfere with the conventional cancer treatments,” “Treatments may have side effects,” “Acupuncture needling is too painful,” “Acupuncture treatments cost too much

money,” “It is hard to find good acupuncturists,” “I don’t have time to go to acupuncture treatments,” “I don’t have knowledge about acupuncture treatments,” “Acupuncture treatments are not covered by my insurance,” and “I don’t have transportation to acupuncture treatments.” The response options range from “strongly disagree” to “strongly agree,” with scores from 1 to 5 (1 = “strongly disagree,” 3 = “not sure,” and 5 = “strongly agree”). The sum score ranges from 10 to 50, with a higher score indicating more barriers to use CAM. ABCAM was previously validated in 317 cancer patients with acceptable internal consistency (Cronbach’s  $\alpha$  coefficient of .76).<sup>15</sup>

### *Sociodemographic Variables*

We acquired demographic factors such as age, race, education level, and employment status through patient self-report.

### *Statistical Analysis*

Research assistants entered all data with verification by a separate data manager. Less than 5% of the data were missing in all of the key variables described in the article. Data analysis was performed using STATA 12.0 for Windows (STATA Corporation, College Station, TX). To identify the reasons patients were hesitant to use acupuncture, if a participant answered “agree” or “strongly agree,” we considered this to be one of the factors associated with barriers to use. We performed multiple linear regression analysis to determine the relationship between relevant socioeconomic factors associated with perceived barrier scores. In addition, we performed cross-tab analysis between race and education. All analyses were 2-sided with a  $P$  less than .05 indicating significance. Our sample size was determined by the parent study.

## Results

### *Baseline Characteristics of Participants*

Among 593 participants, the mean age was 62.9 years (SD = 9.6, range = 26-88). The majority of participants were white (84.8%). Educational status varied among the participants: 18.6% had a high school-level education or less, and 81.4% had college-level education or above. Approximately half (51.3%) of the participants were employed, and 48.7% were not employed. Only 4.7% of the subjects in this study had used acupuncture during the past 12 months. The characteristics of the study participants are summarized in Table 1.

### *Perceived Barriers to Acupuncture Use*

Among the 593 participants, lack of knowledge about acupuncture treatment (41.6%,  $n = 247$ ) and lack of insurance coverage for acupuncture treatment (25%,  $n = 148$ ) were

**Table 1.** Baseline Characteristics of Participants.

Total participants, N	593
Age (mean $\pm$ SD)	62.9 $\pm$ 9.5
Race, n (%)	
White	503 (85)
Nonwhite	90 (15)
Educational level, n (%)	
High school or less	110 (19)
College or above	482 (81)
Employment, n (%)	
Employed	304 (51)
Not employed	289 (49)
Perceived barrier (mean $\pm$ SD)	26.0 $\pm$ 5.9

both perceived barriers to acupuncture use. Additional barriers were concern for the high cost of acupuncture treatment (22.3%,  $n = 132$ ), difficulty finding qualified acupuncturist (18.6%,  $n = 110$ ), concern for the time required for acupuncture (16.7%,  $n = 99$ ), concern for side effects associated with acupuncture treatment (7.9%,  $n = 47$ ), concern for acupuncture needling being too painful (7.6%,  $n = 45$ ), concern that acupuncture treatments are not based on science (7.1%,  $n = 42$ ), concern for lack of transportation to acupuncture treatment (5.1%,  $n = 30$ ), and concern for interference with conventional treatment (4.7%,  $n = 28$ ); see Figure 1.

### Factors Associated With Barriers to Acupuncture Use

The total barrier score was 26.0 (SD = 5.9, range = 10-50). Cronbach's  $\alpha$  was .76. Multiple linear regression analysis showed that race and education level were significantly associated with perceived barriers to acupuncture use. Compared with white participants, being nonwhite significantly increased the perceived barrier score by 1.63 points ( $\beta$  coefficient, 95% CI = 0.3-2.9,  $P = .013$ ). Compared with those with an education level higher than college, high school or less education significantly increased the perceived barrier score by 4.23 (95% CI = 3.0-5.4,  $P < .001$ ). Age and employment status did not significantly affect barriers to acupuncture use scores (Table 2).

### Specific Barriers by Race and Education Level

Compared with white participants, a statistically significant lower percentage of nonwhite participants listed lack of insurance as one of the barriers to acupuncture usage (15.9% vs 26.7%,  $P = .031$ ), and a higher percentage of nonwhite participants listed concerns for side effects as one of the barriers (13.3% vs 7%,  $P = .042$ ; Figure 2). Compared with participants with college or higher education level, a statistically higher percentage of participants with high school or

less education listed barriers to acupuncture usage due to concerns that acupuncture is not based on science (13.9% vs 5.6%,  $P = .003$ ), transportation issues (11.1% vs 3.8%,  $P = .002$ ), and interference with conventional treatment (9.3% vs 3.8%,  $P = .016$ ; Figure 3). We also found that nonwhites were less likely to have college or greater education than whites (67.8% vs 83.9%,  $P < .001$ ).

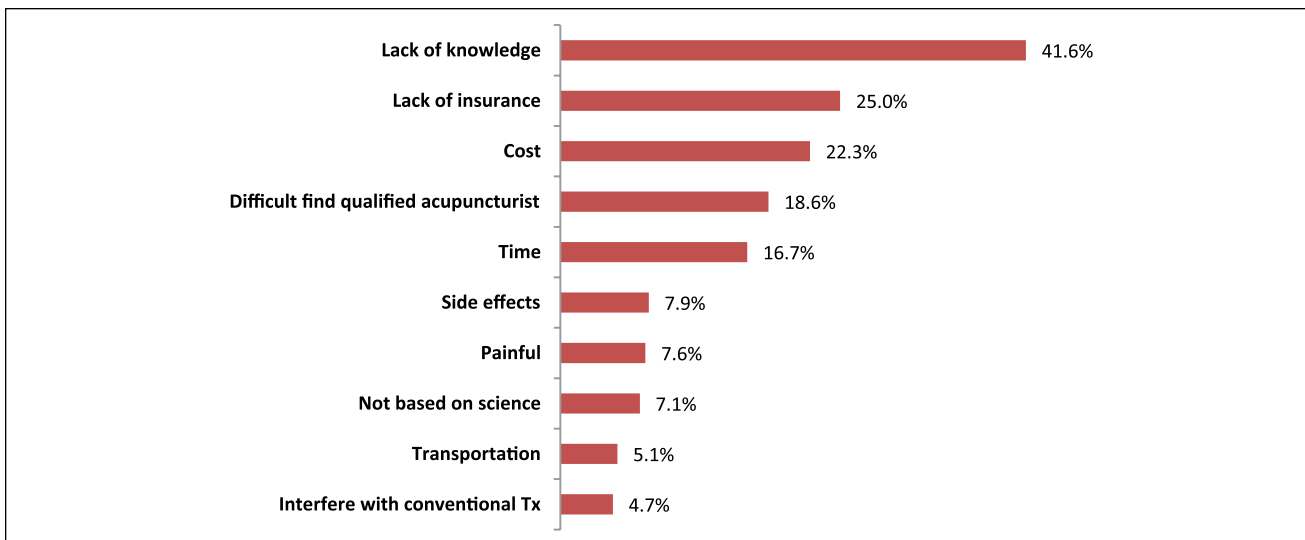
### Discussion

Among the over 3 million BC survivors in the United States, 46% to 73% experience hot flashes<sup>16,17</sup> and more than 30% experience chronic pain<sup>18</sup> that may benefit from acupuncture. However, acupuncture utilization in this population remains low.<sup>11-13</sup> In this large cross-sectional study of 593 patients, we found common barriers, such as lack of knowledge, that are addressable. Our analysis also showed that those who are nonwhite and have an education of high school or less have a statistically significant higher perceived barrier score, further suggesting that they are an ideal target population to receive more education on acupuncture. Our findings call for additional research and interventions in these areas to overcome acupuncture utilization barriers.

As far as we know, this is the first study to determine that lack of knowledge is the most common reason BC survivors do not use acupuncture. This is an exploratory study. Our finding is consistent with a prior study showing that 15% of nonusers among the general population in the United States attributed their nonuse of acupuncture to their lack of knowledge because they "never heard of it/don't know much about it."<sup>19</sup> As our study reveals, if lack of knowledge is the chief reason averting BC patients from acupuncture usage, interventions need to be developed to educate women with BC about acupuncture's potential benefits and accessibility and then determine whether such educational efforts increase their use of acupuncture.

Furthermore, our finding that the concern over lack of insurance coverage hinders acupuncture usage has been reported in the past.<sup>20,21</sup> Our study is consistent with this literature, with 1 in every 4 patients reporting lack of insurance as a barrier to acupuncture treatment. As BC survivors' desire to use acupuncture and other forms of CAM has been widely reported,<sup>22</sup> the hindrance of acupuncture usage due to insurance is a major concern.

Interestingly, previous studies on noncancer patients have shown that while the lack of insurance coverage affects patients' decisions to initiate and/or discontinue acupuncture treatment,<sup>20</sup> the type of insurance may prevent acupuncture usage as well.<sup>21</sup> A study found that noncancer patients with private medical insurance were more likely to access acupuncture than those who did not have private insurance.<sup>21</sup> A UK study reported that noncancer patients who did not have private insurance but initiated acupuncture treatment were



**Figure 1.** Perceived barriers to acupuncture use.

**Table 2.** Factors Associated With Barriers to Acupuncture Use.

Factors	Perceived Barrier Scores		
	Mean (SD)	Coefficient (95% CI)	P
Age			
<60 years	25.5 (5.7)		
≥60 years	26.3 (6.0)	0.44 (-0.6 to 1.4)	.40
Race			
White	25.7 (5.9)		
Nonwhite	27.9 (5.3)	1.63 (0.3 to 2.9)	.013
Educational level			
College or above	25.2 (5.8)		
High school or less	29.6 (4.8)	4.23 (3.0 to 5.4)	<.001
Employment			
Employed	25.7 (5.3)		.46
Not employed	26.3 (6.4)	-0.37 (-1.4 to 0.6)	

Abbreviation: CI, confidence interval.

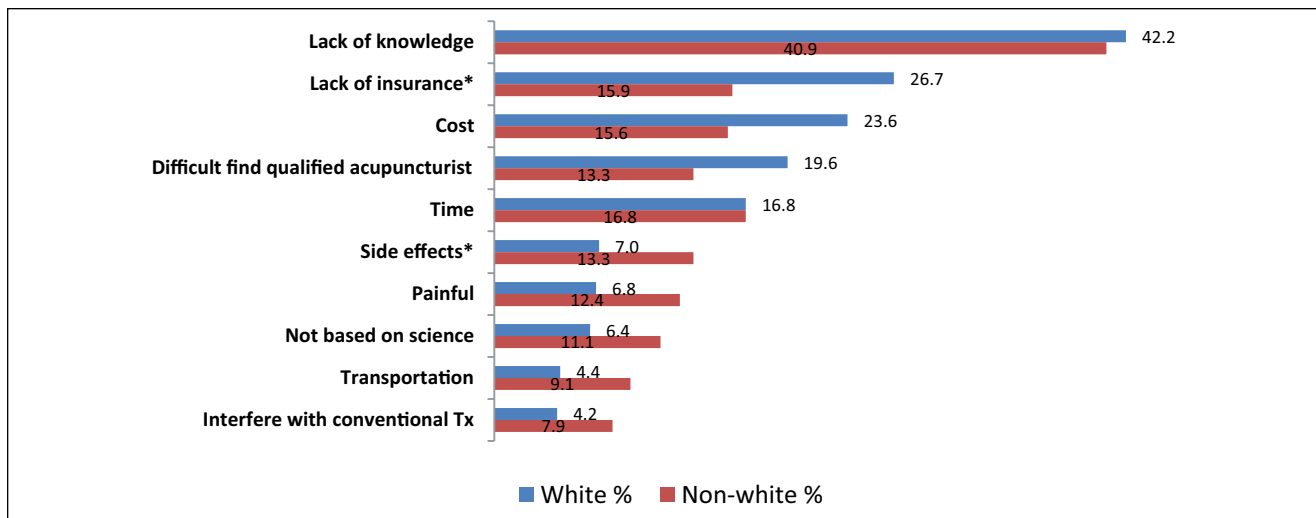
more likely to discontinue treatment due to an inability to pay for it.<sup>20</sup> Moreover, it has been reported that BC patients, specifically those who utilize alternative therapies including acupuncture, have more private insurance than those who do not utilize such therapies.<sup>21</sup>

This lack of usage due to insurance costs creates a parallel barrier for patients known as financial toxicity. The impact of financial toxicity on treatment has been identified in the literature as a strain on patients that leaves them with medical bills, putting them at financial risk, and, at times, resulting in their bankruptcy.<sup>23</sup> In the United States, Medicare and Medicaid do not cover acupuncture treatments. Some private insurance companies may cover acupuncture based on patients’ symptoms, but this coverage is limited. If insurance companies do not

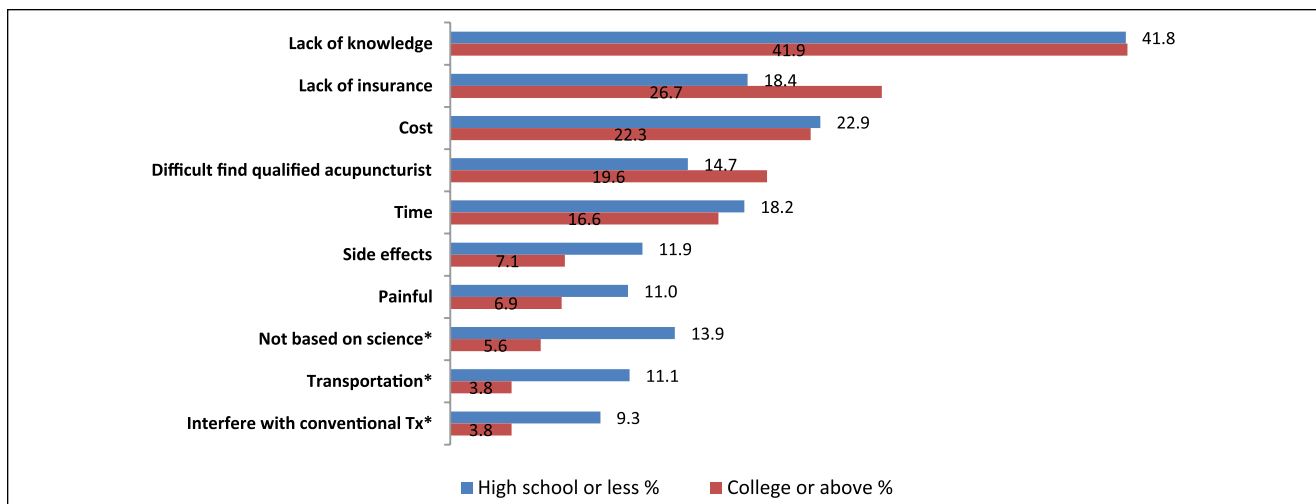
cover acupuncture, patients must pay out of pocket, which may cause significant financial toxicity. This is of particular concern for cancer patients because insurance coverage has been shown to improve patients’ access to care and outcomes.<sup>24</sup> To address the effect of insurance on cancer patients’ options, including acupuncture, administrative health professionals should inquire further about insurance coverage for CAM modalities. These inquiries may occur externally with insurance companies and internally within their own practices and institutions. Relevant conversations may identify solutions, such as alternative payment plans, to make acupuncture and other CAM treatments more available to patients regardless of their insurance status or coverage. Gathering information that insurance companies need to offer coverage for CAM might also help identify areas of future research.

Consistent with previous literature, our study revealed that minority patients have higher perceived barriers to using acupuncture.<sup>25</sup> Prior research has shown that ethnic and cultural background could affect CAM use<sup>25</sup> and that minority patients have less preference for acupuncture over other treatments. However, there is limited literature exploring the reasoning behind this gap.<sup>25</sup> Our study findings suggest that lack of transportation and knowledge about acupuncture’s potential benefits and appropriateness are factors in lack of usage. To identify potential resolutions to these barriers, further research should focus on improving patient education to convey the scientific basis and safety of acupuncture, and on finding solutions to address transportation needs.

Our study also found that less educated patients have higher perceived barriers to both lack of insurance and difficulty in finding qualified acupuncturists. This is consistent with previous studies showing that an education above high school is associated with more use of CAM therapies<sup>21</sup> and with more willingness to participate in acupuncture clinical



**Figure 2.** Perceived barriers by race (\* $P < .05$ ).



**Figure 3.** Perceived barriers by education (\* $P < .05$ ).

trials.<sup>26</sup> Further investigation is needed to target these perceived barriers for those with a high school education or less by offering additional education on acupuncture and information on the best way to identify qualified acupuncturists. As demonstrated by our analyses, nonwhite participants were also likely to have lower education and are therefore especially at risk for having more barriers to acupuncture use.

Our study has several limitations. Because it was conducted by self-report, social desirability and recall bias may be present. We evaluated perceived barriers, which may be different than actual barriers. As our study population was limited to postmenopausal estrogen receptor-positive BC survivors taking an AI, our results may not be applicable to other cancer populations. Also, as the majority of our study patients were white and because our study was completed at

an academic medical center, our results may be limited in their generalizability to nonwhite races and to practice settings outside of an academic medical center.

Nonetheless, our study is the first to reveal that lack of knowledge about acupuncture is the most common reason that BC survivors do not use this treatment modality. Furthermore, our finding that lack of knowledge is the highest perceived barrier for BC survivors, regardless of race or education level, could lead to a push for more education initiatives aimed at informing BC patients about acupuncture as a potential modality to treat their symptoms. Additionally, our finding that lack of insurance is the second largest barrier for BC patients to use acupuncture calls for further research to identify potential resolutions to this significant issue. Ultimately, addressing these barriers systematically may increase access and provide equitable

complementary and integrative medicine services to BC patients from diverse backgrounds.

### Authors' Note

The views expressed in the article are the authors' own and not an official position of their institutions or funding agencies.

### Declaration of Conflicting Interests

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

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded in part by a National Cancer Institute R01CA158243 (Mao) and R21CA173263 (Bao), and by a Memorial Sloan Kettering Cancer Center P30 grant (P30-CA008748).

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