

Older Breast Cancer Survivors: Factors Associated With Change in Emotional Well-Being

Kerri M. Clough-Gorr, Patricia A. Ganz, and Rebecca A. Silliman

ABSTRACT

Purpose

During the 5 years after primary breast cancer diagnosis for women ≥ 65 years old, we examined factors associated with change in emotional well-being.

Patients and Methods

We identified women diagnosed with primary breast cancer and selected women with stage I to IIIa disease, age ≥ 65 years, and for whom we had permission from the attending physician to contact. Data were collected during 5 years of follow-up from consenting patients' medical records and telephone interviews with patients. Outcomes included a five-question Mental Health Inventory general measure of emotional health (MHI5) and two cancer-specific measures: breast cancer-specific emotional health (BCSEH) and Cancer Rehabilitation Evaluation System-Short Form (CARES-SF) Psychosocial Summary Scale.

Results

During 5 years of follow-up of older breast cancer survivors, 57% had less than a ± 10 -point change in MHI5, 38% had less than a ± 10 -point change in BCSEH, and 52% had less than a ± 10 -point change in CARES-SF Psychosocial Summary Scale. Women with less than 12 years of education were at greatest risk for having negative changes in both general and breast cancer-specific emotional health. Moreover, we also found that women who perceived themselves as never being cured had greater negative changes in all outcomes. Conversely, those who had better physical function, emotional social support, and positive ratings regarding the quality of medical interactions at baseline were less likely to have poor emotional health during follow-up.

Conclusion

For the majority of older breast cancer survivors, cancer-specific well-being and general emotional health do not change substantially after a breast cancer diagnosis. Among those in whom change occurs, risk factors are similar and may be related to other age-related diseases.

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INTRODUCTION

Breast cancer is the most common type of cancer among US women, with an estimated 211,240 new cases of invasive breast cancer diagnosed in 2005.¹ Sixty percent of cases are diagnosed in women ≥ 60 years old.² Moreover, breast cancer survivors have a 5-year relative survival estimate of approximately 86%, resulting in the vast majority of women with breast cancer becoming long-term survivors.³ Having breast cancer threatens not only patients' physical health but also their emotional well-being.⁴ Substantial numbers of women diagnosed with breast cancer develop anxiety and depression during the first 2 years after diagnosis.^{5,6} Studies have investigated potential risk factors for emotional distress among breast cancer patients and have identified

younger age, lack of social support, marital distress, poor communication with physicians, being employed, and past history of depression as risk factors.⁷⁻¹⁸ Race, educational attainment, and income have not been found consistently to be associated with emotional distress.^{7,14,15,19}

Social support from family, friends, partners, community, and physicians has been associated with better sense of hope and better emotional health, especially among people with pre-existing life stress.⁹⁻¹³ Intervention studies consistently have demonstrated the beneficial effects of psychosocial support on changing of attitudes from pessimism to optimism.²⁰⁻²⁵ However, most study participants have been younger women. Few studies that have investigated what factors influence older women's emotional well-being after a diagnosis of breast cancer and throughout survivorship.

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Extending previous analyses conducted through 15 months of follow-up,²⁶ we studied older women with early-stage breast cancer and asked the following two questions pertaining to 5-year survivorship. What are the patterns of change in emotional well-being? What factors are associated with changes in older women's general and cancer-specific emotional well-being? Our hypothesis was that older age, fewer financial resources, less social support, and more comorbidity would be related to decline in emotional well-being during follow-up.

PATIENTS AND METHODS

Study Sample

The overall longitudinal study design and patient recruitment procedures have been described.²⁷⁻²⁹ Newly diagnosed breast cancer patients were identified through regular review of pathology reports at hospitals or collaborating tumor registries in four geographic regions (Los Angeles, CA; Minnesota; North Carolina; and Rhode Island) with institutional review board approval of the study in each setting. Women were eligible for the study if they had stage I disease and a tumor diameter of 1 cm or greater; if they had stage II or stage IIIa disease; if they were age 65 years or older on the date of diagnosis; and if permission from the attending physician to be contacted for study participation had been obtained. Additional inclusion criteria included no prior history of primary breast cancer and no simultaneously diagnosed or treated second primary tumor at another site. Patients were eligible if they spoke English or had an available translator, and were competent for interview with satisfactory hearing. Eligible participants were mailed an enrollment package and were called by a research staff member from each site who explained the study's purpose and participation requirements. Potential participants were given an opportunity to decline participation and those who verbally agreed to participate were asked to return a signed consent form approved by the institutional review board at each site.

Data Collection

Telephone interviews were conducted at 3 (baseline), 6, 15, 27, 39, 51, and 63 months after definitive surgery. Trained interviewers conducted the interviews (which took an average of 45 minutes each to complete) and obtained demographic information, psychosocial status, health status, and data on breast cancer therapies received. Tumor characteristics and comorbid conditions at the time of diagnosis were collected by medical record review at least 3 months after the date of definitive surgery.

Analytic Variables

Three emotional well-being variables, scaled from zero to 100 (higher scores indicating better emotional health) were constructed as time-varying outcome variables using data from all seven interviews for analysis.

General emotional health. General emotional health was assessed by the five-question Mental Health Inventory general measure of emotional health (MHI5) from the Medical Outcomes Study-Short Form (MOS SF-36).³⁰ The MHI5 is a measure of mental health that correlates strongly with standardized measures of anxiety and depression, and includes items such as "have you been a nervous person," "have you felt calm and peaceful," "have you felt down-

hearted and blue." This scale has been widely used in many populations with chronic disease and cancer.^{16,29,31,32}

Breast cancer-specific emotional health. Breast cancer-specific emotional health (BCSEH) was assessed using a four-item measure of feelings and worries due to potential problems associated with the progression of breast cancer. The items included "dealing with feelings such as anger, fear, grief, and anxiety"; "worries about your family's ability to manage if you get sicker"; "worries about who will take care of you if you get sicker"; and "worries about recurrence of the cancer." In a previous report of a study for which the measure was developed, the Cronbach's α for these items was .78¹⁶; in this study, Cronbach's α is .72.

Cancer-specific psychosocial function. The Cancer Rehabilitation Evaluation System (CARES) and its short form have been used with patients with various types of cancer, and extensively with breast cancer patients.³³⁻³⁶ We used the Psychosocial Summary Scale of the CARES-Short Form (CARES-SF), a 17-item scale that measures cancer-related anxiety in the last 4 weeks, discomfort with body changes, difficulty sleeping, difficulty concentrating, communication with friends and relatives, worry about whether the cancer is progressing or recurring, feeling nervous in medical settings, difficulty taking care of self, and difficulty in the work setting due to the cancer.

We used baseline data for independent variables because some independent variables were only collected during the baseline interview and none of the independent variables collected at follow-up interviews were available consistently at uniform time points. Using time-varying covariates with data elements missing inconsistently across time would restrict both the model building and interpretation.

Sociodemographic characteristics. We classified patient age as 65 to 69, 70 to 79, or 80+ years old; race as white or nonwhite; marital status as married or not married; education as less than high school, high school, or more than high school; employment status as working full/part time for pay, or unemployed; and health insurance as receiving Medicaid or not.

Health status. We determined the number and type of underlying diseases present at the time of diagnosis using definitions developed for the Index of Co-Existent Diseases.³⁷ The presence of as many as fourteen comorbid conditions measured total disease burden. Body mass index was classified as less than 20, 20 to 25, more than 25 to 30, or more than 30. Physical function was assessed by the Physical Function Index (PFI) -10 (scaled from zero to 100, with higher scores indicating better function) from the MOS SF-36.³⁸

Social support. Social support was measured using a reduced set of eight items derived from the 19-item MOS social support scale.³⁹ Two scales comprised of four items each (Cronbach's $\alpha > .89$ for both) correspond to emotional social support (someone available to have a good time with; to turn to for suggestions about dealing with a personal problem; who understands your problems; to love and make you feel wanted), and instrumental social support (help if confined to bed; to take you to the doctor; to prepare meals if you are unable; to help with daily chores).²⁶ Scores based on each of the four items were scaled from zero to 100, with higher scores indicating more support.

Tumor and treatment characteristics. We classified stage as I, IIa, IIb, or IIIa, using the TNM classification.⁴⁰ We classified primary tumor therapy as breast-conserving surgery (BCS) followed by radiation therapy, BCS alone, or mastectomy. Women self-reported receiving chemotherapy and adjuvant tamoxifen therapy. Patients' perception of being cured of breast cancer was considered as feeling

cured now, cured between 1 to 5 years after treatment, or never completely cured.

Medical interaction. We used the CARES-SF Medical Interaction Summary Scale, a four-item scale that assesses problems communicating with doctors in the last 4 weeks. The CARES-SF medical interaction scores range from 1 to 4, which were transformed to a zero- to 100-point scale, with higher scores indicating better ratings.

Analytic Strategy

We first obtained descriptive statistics (univariate, proportion, and frequency) on all study variables. We then examined the bivariate relations between the independent variables and each outcome variable using Pearson correlations, χ^2 tests, and paired *t* tests. Independent variables were evaluated for potential inclusion in our models based on their association with each outcome variable.

To evaluate factors associated with change of outcomes, we created three multivariable logistic regression models using generalized estimating equations (GEE) in SAS software (SAS Institute, Cary, NC).^{41,42} We chose to use GEE over a mixed-model approach to fit the average effect and the longitudinal effect, producing coefficients that measure differences in the average response for a unit change in the predictor. GEE make use of all available data, so if a participant left the study or died, she continued to contribute data up to the time of attrition. The final subset of candidate independent variables was selected by the model-building strategy described by Greenland.⁴³

To verify the integrity of our findings and to understand better the potential effects of missing data and attrition bias during follow-up, we conducted additional complete case analyses (N = 232). The results from the complete case analyses were virtually unchanged from the initial findings except for increased imprecision resulting from the reduced sample size. In addition, to evaluate the large change in MHI5 scores at the 39-month interview time point, we analyzed the MHI5 scores before and after the 39-month interview of the subgroup of women who contributed data to the 39-month interview and compared them to that of the entire sample. Analyses indicated no between-group differences before or after the 39-month interview. Lastly, analysis of the group of women with breast cancer recurrence (n = 53) did not reveal any differences in outcomes at any time point in comparison to the overall population.

RESULTS

We observed 660 women for up to 5 years after definitive surgery. Approximately one fourth of the population came from each of the four study sites. Baseline sociodemographic and medical characteristics of the study population are listed in Table 1. The majority (74%) were age 70 years or older. Most (94%) were white and had a high school education or greater (83%). Just less than half were married and the majority had adequate finances to meet their needs. Only a small proportion (10%) was working full or part time at baseline. The majority (65%) had two or less comorbid conditions and 21% had a body mass index of 30 or greater. About half of the women had stage I disease and the majority (82%) received either a mastectomy or BCS followed by radiation. Only a small minority (7%, which was a cross-section by stage of the women in the study) believed that they would never be cured. Baseline measures of our three outcome variables ranged from 68.1 to 80.7.

Table 1. Baseline Sociodemographic and Medical Characteristics of Sample (N = 660)

Characteristic	No. of Patients	%*
Site		
LA	150	23
RI	163	25
MN	188	28
NC	159	24
Age, years		
65-69	172	26
70-79	372	56
80+	116	18
Race/ethnicity		
White	620	94
Other	40	6
Education		
< High school	115	17
High school	228	35
> High school	316	48
Marital status		
Married	304	46
Not married	356	54
Adequate finances to meet needs		
Yes	587	89
No	65	10
Employment		
Working full/part time	65	10
Unemployed	595	90
Medicaid		
Yes	40	6
No	605	92
No. of comorbid conditions		
0	86	13
1-2	340	52
3-4	172	26
5 or more	57	9
BMI		
< 20	43	6
20-25	254	39
> 25-30	221	34
> 30	140	21
Stage of breast cancer		
I	336	51
IIA	198	30
IIB	100	15
IIIA	25	4
Type of therapy		
BCS + radiation	215	33
BCS without radiation	102	16
Mastectomy	316	49
Other	17	2
Chemotherapy		
Yes	145	22
No	515	78
Adjuvant tamoxifen therapy		
Yes	498	75
No	162	25
Perception of being cured		
Cured now	193	29
Cured after treatment	317	48
Never cured	48	7
MHI5		
Mean	80.7	
SD	17.8	

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Table 1. Baseline Sociodemographic and Medical Characteristics of Sample (N = 660) (continued)

Characteristic	No. of Patients	%*
BCSEH		
Mean	68.1	
SD	21.5	
CARES-SF		
Mean	78.6	
SD	15.5	

Abbreviations: LA, Los Angeles, CA; RI, Rhode Island; MN, Minnesota; NC, North Carolina; BMI, body mass index; BCS, breast-conserving surgery; MHI5, five-question Mental Health Inventory general measure of emotional health; SD, standard deviation; BCSEH, breast cancer-specific emotional health; CARES-SF, Cancer Rehabilitation Evaluation System-Short Form.

*Not all characteristics add up to N = 660 because of response categories "other" and "do not know," and missing data.

Patterns of Change in Emotional Well-Being

Figures 1 and 2 show the pattern of change in outcomes during the study period. During 5 years of follow-up, the majority of older breast cancer survivors remained the same with respect to emotional well-being. Fifty-seven percent had less than a ± 10 point change in MHI5, 38% had less than a ± 10 point change in BCSEH, and 52% had less than a ± 10 point change in CARES-SF Psychosocial Summary Scale. There was a decrease of 2.8 ($P = .005$) points in the mean MHI5 score, an increase of 1.4 ($P = .2$) points in the mean BCSEH score, and an increase of 10.9 ($P < .0001$) points in the mean CARES-SF score. The patterns of changes, whether increases or declines, were consistent during the follow-up period.

To evaluate the difference in outcome patterns for general emotional health, BCSEH, and cancer-specific psychosocial function, we examined the relations at each interview between the outcome variables, and between each outcome variable and physical function (PF) and emotional support. The overall population experienced a decline of 11.4 points ($P < .0001$) in mean PF score and an increase of 7.1 points ($P < .0001$) in mean emotional support score during the

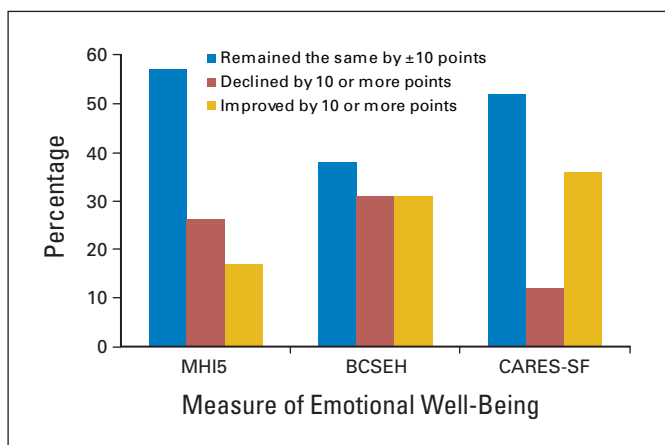


Fig 1. Change in general emotional health (five-question Mental Health Inventory general measure of emotional health [MHI5]), breast cancer-specific emotional health (BCSEH), and Cancer Rehabilitation Evaluation System-Short Form (CARES-SF) Psychosocial Summary Scale. Percentage of women who remained the same, declined, or improved during 5 years of follow-up.

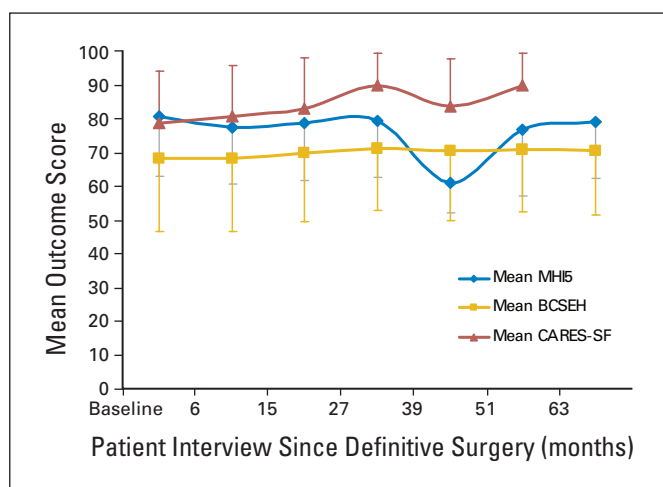


Fig 2. Mean scores with standard deviation of general emotional health (five-question Mental Health Inventory general measure of emotional health [MHI5]), breast cancer-specific emotional health (BCSEH), and Cancer Rehabilitation Evaluation System-Short Form (CARES-SF) Psychosocial Summary Scale during 5 years of follow-up.

follow-up period. The decline in PF scores during follow-up was greater in the group of women who had also declined in MHI5 score as compared with those women whose scores remained the same (-16.0 points; $P = .003$) or improved (-11.7 points; $P = .004$). At each interview, PF was more strongly related to MHI5 than the other two outcome variables. BCSEH was consistently more strongly related to CARES-SF, and BCSEH and CARES-SF were moderately related to emotional support (data not shown; $P < .05$ for all correlations).

Change in General Emotional Health

The results of the GEE model for the general emotional health outcome are listed in Table 2. Having the perception of never being cured at baseline, a high school education or less, and less than adequate finances to meet needs were associated with poor general emotional health during follow-up. Those with better initial PF, better

Table 2. Results of Generalized Estimating Equations: Factors Assessed at Baseline Associated With Change in General Emotional Health (MHI5)

Independent Variable	Standardized Parameter Estimate (β)	95% Confidence Limits	P
Perception of being cured			
After treatment v cured now	-1.73	-3.61, 0.15	.07
Never cured v cured now	-6.89	-10.98, -2.79	.001
Education			
< 12 v ≥ 13	-5.08	-7.92, -2.25	.0004
12 v ≥ 13	-2.08	-4.01, -0.15	.03
Not adequate finances			
	-3.40	-6.19, -0.61	.02
Comorbidity			
1-2 v 0	0.23	-2.21, 2.68	.85
3-4 v 0	-0.66	-3.79, 2.47	.68
≥ 5 v 0	1.91	-2.62, 6.44	.41
Physical function			
	0.08	0.04, 0.12	.0001
Emotional social support			
	0.19	0.14, 0.24	< .0001
Medical interaction			
	0.13	0.07, 0.18	< .0001

Abbreviation: MHI5, five-question Mental Health Inventory general measure of emotional health.

initial emotional social support, and better medical interactions were less likely to have poor general emotional health during follow-up.

Change in BCSEH

Having a less positive perception of being cured and having less education were also associated with poor BCSEH in the first 5 years after definitive treatment for breast cancer (Table 3). Conversely, those who had five or more comorbid conditions, better PF, better emotional social support, and positive ratings regarding the quality of medical interactions at baseline were less likely to have poor BCSEH during follow-up.

Change in Cancer-Specific Psychosocial Function

Factors associated with changes in cancer-specific psychosocial quality of life are listed in Table 4. Consistent with the other measures of emotional well-being, the CARES-SF Psychosocial Summary Scale scores for women who perceived themselves as being cured 5 or more years after treatment, those with less than a high school education, and those without adequate finances to meet their needs declined significantly during the follow-up period. Better PF, emotional social support, and positive ratings of the quality of medical interactions at baseline were positively associated with CARES-SF Psychosocial Summary Scale scores during follow-up.

DISCUSSION

This research is consistent with and a complement to our previously published findings.^{26,44} We assessed three different outcome measures, each measuring a different aspect of emotional well-being: general mental health, BCSEH, and cancer-specific psychosocial function. Our findings suggest that the 5-year survivorship experience of older women with breast cancer is one of relative stability for two of the three measures, given that the overall BCSEH changes were minimal, and changes in MHI5 of less than 8 points are not considered to be clinically significant.^{30,38} All outcomes had a common set of risk factors, with consistent effects on all three measures of emotional well-being.

Our exploration of the relationship among outcome measures, PF, and emotional support demonstrate that these outcome measures

Table 3. Results of Generalized Estimating Equations: Factors Assessed at Baseline Associated With Change in Breast Cancer–Specific Emotional Health

Independent Variable	Standardized Parameter Estimate (β)	95% Confidence Limits	P
Perception of being cured			
After treatment v cured now	-3.90	-6.36, -1.45	.002
Never cured v cured now	-13.10	-18.38, -7.82	< .0001
Education			
< 12 v \geq 13	-5.05	-8.62, -1.49	.006
12 v \geq 13	-1.73	-4.23, 0.77	.18
Not adequate finances	-1.02	-3.57, 1.53	.43
Comorbidity			
1-2 v 0	1.49	-2.24, 5.23	.43
3-4 v 0	0.61	-3.67, 4.89	.78
\geq 5 v 0	6.85	1.02, 12.69	.02
Physical function	0.08	0.03, 0.14	.003
Emotional social support	0.40	0.33, 0.46	< .0001
Medical interaction	0.09	0.02, 0.15	.02

Table 4. Results of Generalized Estimating Equations: Factors Assessed at Baseline Associated With Change in CARES-SF Psychosocial Summary Scale

Independent Variable	Standardized Parameter Estimate (β)	95% Confidence Limits	P
Perception of being cured			
After treatment v cured now	-2.10	-3.71, -0.50	.01
Never cured v cured now	-7.87	-11.11, -4.63	< .0001
Education			
< 12 v \geq 13	-2.74	-5.34, -0.14	.03
12 v \geq 13	0.88	-0.76, 2.53	.29
Not adequate finances	-2.38	-4.34, -0.41	.02
Comorbidity			
1-2 v 0	0.67	-1.83, 3.17	.60
3-4 v 0	1.42	-1.45, 4.30	.33
\geq 5 v 0	2.47	-1.35, 6.30	.20
Physical function	0.09	0.05, 0.13	< .0001
Emotional social support	0.21	0.17, 0.26	< .0001
Medical interaction	0.19	0.14, 0.23	< .0001

Abbreviation: CARES-SF, Cancer Rehabilitation Evaluation System-Short Form.

are related, but are measuring different aspects of emotional well-being. As previously reported by Ganz et al²⁶ and supported by our findings, we believe that the longitudinal decline in MHI5 scores is influenced by the decline in overall PF of these women during the follow-up period, as suggested by the larger decreases in PF scores during follow-up among women whose MHI5 scores also declined. In contrast, the cancer-specific adjustment of these women improved during follow-up. Emotional support, which increased significantly during follow-up, was most strongly correlated with both of our cancer-specific outcome measures, suggesting that adaptation and adjustment to cancer-specific concerns is closely related to the presence and amount of emotional support.

We found that perception of being cured and educational attainment were negatively associated, and PF and social support were modestly positively associated with all three outcomes. Many studies have investigated potential risk factors for emotional distress among breast cancer patients.^{7-17,32,36,45-48} However, few of these studies have investigated these factors and the patterns of change in emotional well-being outcomes over time. Our findings are consistent with studies that have shown that educational attainment is associated with emotional distress.^{7,14,15,19,49} Those with less than 12 years of education were at greatest risk for having negative changes in both general emotional health and BCSEH. Moreover, we also found that women who perceived themselves as never being cured at baseline had greater negative changes in all outcomes, again consistent with the work of others that has identified “feeling of hopefulness” as an important factor in predicting emotional health among women with breast cancer.^{47,50,51}

A broad literature on depressive illness in older adults suggests that increased comorbidity, decreased PF, and lack of financial resources and social supports are predictors of depressive illness in the general geriatric population.⁵²⁻⁵⁹ Our research indicates that these factors are also associated with a decline in emotional well-being among older long-term breast cancer survivors. This raises the following question: are these factors cancer-specific or more general predictors of psychosocial distress in older adults? Conceivably, these factors function as markers (in constellation or individually) for a high-risk

population, cancer survivor or not, that is more vulnerable not just to poor adjustment to their cancer experience but also to other conditions such as depression.

Although there are a number of factors identified in this and other research^{16,60} that are immutable (eg, educational attainment), it is important to note that modifiable factors can make a difference to the survivorship experience of older women with breast cancer. Medical interaction, as measured by a woman's perception of physician-patient communication, had a positive association with both cancer-specific outcomes. How doctors interact with their patients seems to have an enduring effect on how women cope with cancer-specific issues over time. Our regression analyses also indicate that emotional social support is associated significantly with positive changes in all aspects of emotional well-being. These findings suggest that physician and family interventions to enhance social support may buffer the impact of a breast cancer diagnosis and improve the overall survivorship experience.

The major limitation of our study is that our study population was a largely white, well-educated group of older women, which limits generalizability of the results. Even though there are limitations in the representativeness of this study population, the findings have important implications for clinical practice. Interventions designed to bolster formal and informal support and improve PF and medical

interactions may mitigate the impact of these risk factors. Targeting care for high-risk individuals could help to focus the resources available in clinical practice to those patients most likely to benefit.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

The authors indicated no potential conflicts of interest.

AUTHOR CONTRIBUTIONS

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