The Mediation and Suppression Effect of Demoralization in Breast Cancer Patients After Primary Therapy: A Structural Equation Model

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ABSTRACT

Background: Because of the increasing 5-year survival rate of breast cancer, adjustment to breast cancer survivorship is pertinent to the patient’s life after diagnosis. Despite the psychological changes occurring during the transitional period (first 5 years after diagnosis) and after primary therapy having a known, critical effect on survivorship status, the data related to this topic are very limited.

Purpose: This study was designed to examine the relationships among demoralization, stress, sleep disturbance, and psychological well-being in women with breast cancer after primary therapy.

Methods: Two hundred eight women with breast cancer (mean age = 51.96 ± 8.27) participated in a cross-sectional study in central Taiwan. Recruitment was conducted using convenience snowball sampling at a local teaching hospital. All of the participants had completed primary therapy and were in the 5-year postdiagnosis period. The average duration of cancer was 28 months. The participants completed the Stress of Breast Cancer after Primary Therapy Scale, Demoralization Scale, Pittsburgh Sleep Quality Inventory, and Ryff’s Psychological Well-Being Scale—Short Form. Data were analyzed using a structural equation model to find plausible path relationships among stress, demoralization, sleep disturbances, and psychological well-being.

Results: Demoralization was shown to completely mediate the effect of stress on sleep disturbances. In addition, the predictive effect of sleep disturbances on psychological well-being was overwhelmingly explained by demoralization when competing with sleep disturbances. Furthermore, a positive path was found between stress and psychological well-being because of the suppression effect of demoralization.

Conclusions/Implications for Practice: Demoralization was found to be a mediator that suppressed the relationships among stress, sleep disturbances, and psychological well-being in the adaptation process of patients with breast cancer after primary therapy. This article adds to the limited research on women with breast cancer (Rodin, 2018). Although many of these studies focused on the experiences of newly diagnosed (Lauzier et al., 2010; T. Y. Lee et al., 2013) or chronic patients with breast cancer (Bloom et al., 2012; Pudrovskia et al., 2013), limited data exist on the physiological and psychological health changes in women during the transitional period after primary therapy and in women in the initial 5 years after their breast cancer diagnosis. Primary therapy for breast cancer typically includes surgery, chemotherapy, radiation therapy, and/or targeted therapy. The period after the completion of all primary therapy interventions with the exception of hormone therapy is a critical period during which patients should move beyond their cancer experiences and reestablish a normal daily routine. Pinpointing key psychological factors that may improve the quality of life of patients with breast cancer after primary therapy will help healthcare providers develop effective strategies to facilitate the adjustment of these patients.

KEY WORDS: breast cancer, demoralization, psychological well-being, stress, sleep disturbances.

Introduction

Parallel with the increase in the morbidity rate of breast cancer in recent years, the 5-year survival rate for breast cancer has increased to more than 90% (Health Promotion Administration, 2019; Howlader et al., 2018). The levels of threat and chronic stress related to this disease are pertinent to the lives of survivors of breast cancer. Over the last two decades, research has confirmed the beneficial effects of psychosocial factors on women with breast cancer (Rodin, 2018). Although many of these studies focused on the experiences of newly diagnosed (Lauzier et al., 2010; T. Y. Lee et al., 2013) or chronic patients with breast cancer (Bloom et al., 2012; Pudrovskia et al., 2013), limited data exist on the physiological and psychological health changes in women during the transitional period after primary therapy and in women in the initial 5 years after their breast cancer diagnosis. Primary therapy for breast cancer typically includes surgery, chemotherapy, radiation therapy, and/or targeted therapy. The period after the completion of all primary therapy interventions with the exception of hormone therapy is a critical period during which patients should move beyond their cancer experiences and reestablish a normal daily routine. Pinpointing key psychological factors that may improve the quality of life of patients with breast cancer after primary therapy will help healthcare providers develop effective strategies to facilitate the adjustment of these patients.

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Breast cancer is a cause of life-threatening stress that may induce posttraumatic stress disorder or posttraumatic growth (Arnaboldi et al., 2017; Costanzo et al., 2012). Folkman’s (2012) stress–coping model has shown that stress may produce not only negative emotions such as depression and demoralization but also negative reactions such as sleep disturbances, leading to poor psychological well-being. Moreover, depression and sleep disturbance are common factors in breast-cancer-related stress reactions (Rowland & Massie, 2010; Yue & Dimsdale, 2010).

Depression may take many forms in patients with breast cancer both after diagnosis and in daily life, significantly increasing functional disability in these patients (Tang et al., 2015). Kissane and Doolittle (2013) highlighted the divergence between depression and demoralization in patients with cancer, as anhedonic traits are not present in demoralization. “Demoralization” was defined in their study as an expression of existential distress, hopelessness, helplessness, and loss of meaning and purpose in life. Although demoralization is common in patients with cancer, some patients may experience demoralization without experiencing depression (Robinson et al., 2015). Therefore, using depression exclusively to evaluate patients with cancer may neglect as much as 25% of those patients who experience high levels of demoralization but do not present with major depressive disorders (C. Y. Lee et al., 2012; Robinson et al., 2015). In some studies, demoralization was identified as a better construct than depression to predict quality of life in survivorship (Robinson et al., 2015; Tecuta et al., 2015). Hence, demoralization may be described as the experience of hopelessness or helplessness that leads an individual to exhaustion and poor adjustment.

Sleep disturbance is another common stress reaction in breast cancer adaptation (Palesh et al., 2013). The highest prevalence of insomnia among patients with cancer has been reported in those with breast cancer, both during the primary therapy period (Sanford et al., 2013) and afterward (Otte et al., 2010). Furthermore, the findings of studies have indicated that psychological stress may be a precipitating factor of sleep disturbance and that these sleep disturbances may impact negatively on quality of life. Other studies have shown that sleep disturbances may be the cause or consequence of depression, which, in turn, worsens the adaptation of patients with breast cancer (Palesh et al., 2013). In light of the complex, contradictory relationships among stress, depression, and sleep disturbances, this study was developed to establish a model to better depict the path relationships among the above factors.

In their review of the literature on psychological well-being over the past 30 years, Ryff (2014) noted that a multitude of physical illnesses have been implicated as factors that impair psychological well-being. Accordingly, in this study, psychological well-being was used to measure quality of life in patients with breast cancer.

The purpose of this study was to explore the relationships among stress, sleep disturbance, demoralization, and psychological well-being in women with breast cancer after primary therapy. On the basis of the stress–coping model (Folkman, 2012) and the related literature on the plausible relationships among these factors, it was hypothesized in this study that experiencing stress, demoralization, and sleep disturbances impact the psychological well-being of patients. Furthermore, this study aimed to investigate the role of demoralization and sleep disturbances in the stress–coping process. In the hypothesized relationship model, stress serves as an initial cause that affects other factors, whereas psychological well-being serves as an endpoint outcome. Moreover, in this model, demoralization plays an important, core role in terms of determining the extent of the impact on sleep disturbance. The results are expected to identify a number of mediation effects and to improve scholarly understanding regarding the mechanism at work among these factors.

Methods

Design
This cross-sectional study was conducted at a local teaching hospital in central Taiwan. Participants were recruited using a convenience snowball sampling technique. After receiving informed consent, a demographic datasheet and four psychological testing instruments were used to collect the data.

Participants
Two hundred seventeen participants were initially recruited for the study. Patients were included if they were female, diagnosed with breast cancer during the past 5 years, and had completed primary therapy. Exclusion criteria included diagnosis of psychotic or neurocognitive disorders, presenting with any acute or chronic condition that would limit the ability of the patient to participate in the study, being unable to communicate in Chinese, and refusal to give informed consent. Of the recruited population, 4.15% (n = 9) were lost because of incomplete data. The valid response rate was thus 95.85%, with 208 participants.

Procedures
This cross-sectional study was conducted from December 2013 to September 2015. Approval from the Chung Shan Medical Hospital’s institutional review board to collect and analyze data was obtained before conducting the study (No. CS13203). Once the patients were recruited and informed consent was obtained in person, the participants completed the questionnaires, providing information on their demographics, medical history, stress, demoralization, sleep quality, and psychological well-being.

Instruments

The stress of breast cancer after primary therapy scale
The 13-item Stress of Breast Cancer after Primary Therapy Scale (Stress-BCAPTS) was partly adopted from the Mandarin version
of the Newly Diagnosed Breast Cancer Stress Scale (NDBCSS; T. Y. Lee et al., 2013). Each item of the scale is measured on a 4-point Likert scale, ranging from 0 (strongly disagree) to 3 (strongly agree), with higher scores indicating higher experienced stress. The Stress-BCAPTS has good criterion-related validity with the Perceived Stress Scale ($r = .46$, $p < .001$) and the anxiety ($r = .57$, $p < .001$) and depression ($r = .35$, $p < .001$) subscales of the Hospital Anxiety and Depression Scale. The NDBCSS has four subscales: perceptions of unpredictability, perceptions of uncontrollability, perceptions of a heavy psychological load, and perceptions of facing challenge. The perceptions of facing challenge subscale was excluded from the Stress-BCAPTS, whereas the other three were retained. The Cronbach’s $\alpha$ is .89 for the Stress-BCAPTS and .62–.77 for its three subscales. Confirmatory factor analysis showed that each item had a factor loading of .41–.83, indicating acceptable construct validity.

**Demoralization scale**

The Demoralization Scale (Kissane et al., 2004) consists of 24 questions and has been translated into Mandarin (Hung et al., 2010). Each item is measured on a 5-point Likert scale ranging from 0 (strongly disagree) to 4 (strongly agree), with higher scores associated with higher demoralization. The Demoralization Scale has good criterion-related validity and divergent validity (Kissane et al., 2004), earning a Cronbach’s $\alpha$ of .93 for the full scale and $\alpha$ of .60–.86 for its five facets, including loss of meaning and purpose, dysphoria, disheartenment, helplessness, and sense of failure. The translated Mandarin version maintained the same validity and may thus be effectively applied to Mandarin-speaking patients with cancer (Hung et al., 2010). Furthermore, confirmatory factor analysis indicated the factor loading for each item as between .49 and .87, showing acceptable construct validity.

**Pittsburgh sleep quality inventory**

The Pittsburgh Sleep Quality Inventory (PSQI; Buysse et al., 1989) has been translated into Mandarin (Fu, 2007). The PSQI is a self-report questionnaire consisting of 19 items that are designed to assess the respondent’s quality of sleep during the past month. The PQSI investigates seven indicators of sleep quality, including (a) subjective sleep quality, (b) sleep latency, (c) sleep duration, (d) habitual sleep efficiency, (e) sleep disturbances, (f) use of sleeping medication, and (g) daytime dysfunction, with higher scores indicating worse quality of sleep. The questionnaire has good reliability and validity and has been the most effective and most widely used self-report scale in sleep research for cancer (Palesh et al., 2010). The Cronbach’s $\alpha$ of this scale is .77, and the results of confirmatory factor analysis indicate that each factor loading ranges from .41 to .86, showing acceptable construct validity.

**Ryff’s psychological well-being scale–short form**

Ryff’s Psychological Well-Being Scale (Ryff, 1989) has been translated into Mandarin and condensed from the original

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**Table 1**

**Participant Demographic Information (N = 208)**

| Variable                  | n   | %  |
|---------------------------|-----|----|
| Educational level         |     |    |
| Illiterate                | 3   | 1.4|
| Elementary/junior high    | 47  | 22.6|
| Senior high school/vocational | 129 | 62.0|
| University and above      | 29  | 14.0|
| Marital status            |     |    |
| Unmarried                 | 17  | 8.2|
| Married                   | 171 | 82.2|
| Separated                 | 12  | 5.8|
| Widowed                   | 8   | 3.8|
| Monthly income (NT$)      |     |    |
| No income                 | 65  | 31.3|
| Below 20,000              | 40  | 19.2|
| 20,000–50,000             | 78  | 37.5|
| 51,000–80,000             | 19  | 9.1|
| Over 80,000               | 6   | 2.9|
| Comorbidities             |     |    |
| No                        | 144 | 69.2|
| Yes                       | 64  | 30.8|

Note. NT$ = New Taiwan dollar.

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**Table 2**

**Descriptive Statistics and Correlation Matrix Between Variables**

| Variable               | Descriptive Statistics | Pearson’s Correlation Coefficients |
|------------------------|------------------------|-----------------------------------|
|                        | Mean   | SD      | 1       | 2       | 3       | 4       |
| 1. Stress              | 11.53  | 7.55    | -       | .49***  | .22**   | -.05    |
| 2. Demoralization      | 25.96  | 13.75   | .42***  | -       | .49***  | -.67*** |
| 3. Sleep disturbances  | 8.26   | 3.95    | .18**   | .40***  | -       | -.36*** |
| 4. Psychological well-being | 83.62 | 12.37   | -.09    | -.58*** | -.26*** | -       |

Note. Data in the parentheses represent correlation coefficients among latent variables. **$p < .01$. ***$p < .001$ (two-tailed).**
Table 3
Descriptive Statistics and Correlation Matrix Between Each Subscale of All Variables

| Subscale | Descriptive Statistics | Pearson's Correlation Coefficients |
|----------|------------------------|-----------------------------------|
|          | M  | SD  | Sp1  | Sp2  | Sp3  | Sp4  | Sp5  | Sp6  | Sp7  | D1  | D2  |
| Sp1      | 1.51 | 0.87 | 1.0  |      |      |      |      |      |      |      |     |
| Sp2      | 1.67 | 0.87 | .55** | 1.0  |      |      |      |      |      |      |     |
| Sp3      | 1.16 | 0.91 | .37** | .24** | 1.0  |      |      |      |      |      |     |
| Sp4      | 0.75 | 0.96 | .42** | .40** | .53** | 1.0  |      |      |      |      |     |
| Sp5      | 1.65 | 0.63 | .45** | .33** | .23** | .22** | 1.0  |      |      |      |     |
| Sp6      | 0.58 | 1.05 | .44** | .38** | .19** | .20** | .27** | 1.0  |      |      |     |
| Sp7      | 0.94 | 0.80 | .46** | .27** | .15* | .14*  | .41** | .21** | 1.0  |      |     |
| D1       | 3.87 | 3.03 | .34** | .30** | .10  | .09   | .29** | .21** | .27** | 1.0  |     |
| D2       | 6.83 | 3.81 | .37** | .21** | .10  | .17*  | .32** | .11   | .44** | .58** | 1.0  |
| D3       | 6.76 | 4.31 | .35** | .22** | .03  | .10   | .32** | .16*  | .39** | .67** | .80** |
| D4       | 4.05 | 2.95 | .36** | .31** | .10  | .19** | .27** | .16*  | .32** | .71** | .70** |
| D5       | 4.46 | 2.14 | .28** | .23** | .05  | .15*  | .28** | .13   | .21** | .58** | .41** |
| St1      | 3.73 | 2.91 | .08   | -.01 | -.08 | -.12  | .16*  | .06   | .22** | .23** | .32** |
| St2      | 3.68 | 2.71 | .26** | .06   | .04  | -.04  | .29** | .15*  | .29** | .24** | .36** |
| St3      | 4.13 | 3.06 | .18*  | .14*  | .05  | -.04  | .26** | .14*  | .25** | .30*  | .38** |
| P1       | 14.84 | 2.77 | -.19** | -.17* | -.08 | -.13  | -.16* | .01   | -.07  | -.37** | -.27** |
| P2       | 13.75 | 3.02 | -.19** | -.16* | -.05  | -.06  | -.14* | -.07  | -.10  | -.44** | -.29** |
| P3       | 14.25 | 2.48 | -.19** | -.22** | -.06 | -.15* | -.23** | -.01  | -.19** | -.33** | -.23** |
| P4       | 12.80 | 2.72 | -.22** | -.18** | -.00  | -.08  | -.15* | -.07  | -.10  | -.22** | -.28** |
| P5       | 14.66 | 2.59 | -.21** | -.21** | .00  | -.08  | -.19** | -.02  | -.21** | -.45** | -.40** |
| P6       | 13.31 | 2.69 | -.26** | -.28** | -.12 | -.16* | -.28** | -.08  | -.31** | -.44** | -.47** |

Note. Sp1–Sp7 indicate subscale scores, respectively, as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction in Pittsburgh Sleep Quality Inventory; D1–D5 indicate subscale scores, respectively, as loss of meaning and purpose, dysphoria, disheartenment, helplessness, and sense of failure in the Demoralization Scale; St1–St3 indicate subscale scores, respectively, as perceptions of unpredictability, perceptions of uncontrollability, and perceptions of a heavy psychological load in the Stress of Breast Cancer after Primary Therapy Scale; and P1–P6 indicate subscale scores, respectively, as Ryff’s personal growth, purpose of life, positive relationships with others, autonomy, environmental mastery, and self-acceptance in the Psychological Well-Being Scale–Short Form.

*p < .05. **p < .01 (two-tailed).

84 items to an 18-item version with good reliability and validity (Li, 2014). Three items were selected from six indexes that respectively measure (a) self-acceptance, (b) positive relations with others, (c) autonomy, (d) environmental mastery, (e) purpose in life, and (f) personal growth. Each item is measured on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree), with higher scores indicating better psychological well-being. The Psychological Well-Being Scale–Short Form has a Cronbach’s α of .93, and the subscales have α values of .79–.91. Confirmatory factor analysis has shown factor loadings between .67 and .94, indicating acceptable construct validity.

Analyses

Statistical analyses were conducted using IMB SPSS Statistics Version 23 (IBM, Inc., Armonk, NY, USA) for both descriptive and correlational analyses. Structural equation modeling (SEM) was determined using LISREL 8.8 to explore and understand the path relationships among the constructs of interest in the sample. The sample size was expected to be over 200 for SEM models containing five or fewer constructs, each with more than three observed variables, and modest communalities of the observed variables (Hair et al., 2006). In this research, the absolute values of skewness of the 21 variables (subscales) ranged from 0.03 to 1.56 (standard error = .34), whereas the absolute values of kurtosis ranged from .05 to .93 (standard error = .34). These values are generally in line with the normal distribution assumed in the hypothesis. According to the recommendation of Hooper et al. (2008), indices such as chi-square statistic ($\chi^2$), degrees of freedom ($df$), p value, $\chi^2/df$, root mean square error of approximation (RMSEA) and its confidence interval, standardized root mean square residual (SRMR), comparative fit index (CFI), and parsimony goodness-of-fit index (PGFI) should be reported. In addition, goodness-of-fit index
(GFI) may also be presented for reference. Specifically, $p$ value > .05, $\chi^2/df$ < 2 or 3, CFI > .95, GFI > .95, PGFI > .50, SRMR < .08, and RMSEA < .07 with an upper confidence interval limit of < .08 are preferred.

**Results**

**Descriptive Statistics**

The average age of the 208 participants was 51.96 years, with a standard deviation of 8.27 and a range of 29–76 years. Most (89.9%) of the participants were postmenopausal, whereas 95.2% had received surgery, 77.4% had received chemotherapy, 67.8% had received radiation therapy, and 60.6% had received hormone therapy during primary therapy. The average period of remission was 28 months, whereas 42.3% had been diagnosed with Stage 2 breast cancer and 37.5% had been diagnosed with Stage 1. These percentage distributions are largely similar to official government statistics for Taiwan (Health Promotion Administration, 2019). Other sociodemographic characteristics of the sample are shown in Table 1.

Table 2 shows the average level of each scale score and correlation coefficient among their observed scores and among their latent variables for patients with breast cancer after primary therapy. The correlation coefficients among the scale scores were all significant, with the exception of the correlation between stress and psychological well-being. In addition to the SEM, statistics such as means, standard deviations, and correlation coefficients among each subscale scores of all variables are presented in Table 3. In summary, most of the subscales correlated significantly with each other. However, sleep duration did not correlate significantly with all of the subscales of the other three variables, habitual sleep efficiency did not correlate significantly with all of the subscales of stress, use of sleeping medication did not correlate significantly with all of the subscales of...
Confirmatory Factor Analysis Model for Stress, Demoralization, Sleep Disturbance, and Psychological Well-Being (Completely Standardized Solution)

Note. Sp1–Sp7 indicate subscale scores, respectively, as subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction in the Pittsburgh Sleep Quality Inventory; D1–D5 indicate subscale scores, respectively, as loss of meaning and purpose, dysphoria, disheartenment, helplessness, and sense of failure in the Demoralization Scale; St1–St3 indicate subscale scores, respectively, as perceptions of unpredictability, perceptions of uncontrollability, and perceptions of a heavy psychological load in the Stress of Breast Cancer after Primary Therapy Scale; and P1–P6 indicate subscale scores, respectively, as Ryff’s personal growth, purpose of life, positive relationships with others, autonomy, environmental mastery, and self-acceptance in the Psychological Well-Being Scale—Short Form. χ² = 123.14 (df = 128, p = .60), comparative fit index = 1.00, goodness-of-fit index = .95, parsimony goodness-of-fit index = .52, standardized root mean square residual = .054, and root mean square error of approximation < .001. **p < .01, ***p < .001 (two-tailed).
psychological well-being, and none of the subscales of stress correlated significantly with the first four subscales of psychological well-being.

The Mediation and Suppression Role of Demoralization

The confirmatory factor analysis of all of the factors, which had been modified by adding correlation coefficients between errors, is shown in Figure 1, with results showing that $\chi^2 = 123.14$, $df = 128$, $p = .60$, $\chi^2/df = .96$, $CFI = 1.00$, $GFI = .95$, $PGFI = .52$, $SRMR = .054$, and $RMSEA < .001$ with a 90% confidence interval of $.00 < RMSEA < .031$. The SEM with the same modification is shown in Figure 2. The model fit showed $\chi^2 = 123.54$, $df = 130$, $p = .64$, $\chi^2/df = .95$, $CFI = 1.00$, $GFI = .95$, $PGFI = .53$, $SRMR = .054$, and $RMSEA < .001$ with a 90% confidence interval of $.00 < RMSEA < .029$, indicating an acceptable model fit. In addition, all of the structural coefficients ($\beta$) of the SEM were significant ($ps < .001$). Specifically, the direct effects of stress were .48 for demoralization and .37 for psychological well-being. Moreover, demoralization was found to have a direct effect on sleep disturbances ($\beta = .49$) and psychological well-being ($\beta = -.85$). Besides, the indirect effects of stress on psychological well-being and sleep disturbances, respectively, were $-.41$ and $+.24$. In particular, there were two paths in the model, from stress to sleep disturbances and from sleep disturbances to psychological well-being, which were no longer significant as their corresponding bivariate correlation coefficients (refer to Table 2 for details on the correlation coefficients between the latent variables, $r = .22$ and $r = -.36$). In other words, the effect of stress on sleep disturbances were completely mediated by demoralization, and demoralization influenced psychological well-being more strongly than sleep disturbances, resulting in the invalidation of the effects of sleep disturbances on psychological well-being.

Furthermore, when the effect of stress on psychological well-being was mediated by demoralization, the path of the latent variables changed from the initial value of $-.05$ to a subsequent value of $+.37$ (refer to Table 2 and Figure 2). Experienced stress appeared to not significantly correlate with psychological well-being ($-.05$) but had a significant effect ($+.37$) under the mediation of demoralization. This phenomenon is known as the suppression effect (MacKinnon, 2008), in which the effect of...
demoralization on psychological well-being is reinforced (from −.67 to −.85; refer to Table 2 and Figure 2) and the effect of stress on psychological well-being changes in terms of both sign and size (from −.05 to .37).

**Discussion**

The results of this study indicate the presence of significant psychological stress in patients with breast cancer after primary therapy, although the measured stress levels (M = 11.53) were lower than in patients who had just received their diagnosis (M = 17.44; T. Y. Lee et al., 2013). The NDBCSS factor analysis, heavy perceived psychological load, unpredictability, and uncontrollability were found to effectively reflect degree of stress, whereas perceptions of facing challenges were found to have a very low factor loading on stress. This may be because certain items considered in the facing challenge perception factor refer to the period immediately after diagnosis rather than after primary therapy (T. Y. Lee et al., 2013). This was why the subscale was not included in the model. The transition to the role of a survivor of breast cancer after primary therapy commences after radical physical therapy has been completed and before the start of relatively easier hormone therapy procedures. From this, we inferred that the perceived challenges may influence post-diagnosis stress in terms of representing the shock of being threatened by the cancer and the physiological pain. Meanwhile, the subfactor of perceptions of unpredictability included some items related to the fear of recurrence. This fear was found to be an important factor affecting post-primary-therapy adjustment, earning the highest factor loading on stress (.82). Age and stress were found to have a statistically significant and negative correlation (r = −.25, p < .001). This is consistent with previous research findings that, on average, the younger a patient is, the higher the experienced stress (Helgeson et al., 2004). It may be that older women experience more life events and are less worried about facing uncontrolled and unpredictable relapse and death and thus are less overburdened. This is an important point in the development of intervention protocols and self-care programs for younger patients with breast cancer.

On the basis of the results of SEM, demoralization was found to exert mediation and suppression effects in the model. Demoralization had a stronger influence on psychological well-being than sleep disturbances, resulting in the invalidation of the effects of sleep disturbances on psychological well-being. We further found that stress, via demoralization, affected sleep disturbances (0.48 x 0.49 = 0.24; MacKinnon, 2008). In addition, stress was found to directly affect demoralization, which, in turn, influenced psychological well-being (0.48 x (−0.85) = −0.41; MacKinnon, 2008). When patients cope adequately with demoralization, both the negative effect of stress on sleep disturbances and the negative effect of sleep disturbances on psychological well-being may be expected to decrease drastically, to the point at which stress should become a factor promoting wellness (β = .37). In contrast, when demoralization is coped with poorly, the stress may increase sleep disturbances and, in turn, lower wellness. Furthermore, we found that demoralization competed with sleep disturbances in explaining psychological well-being. Thus, demoralization cannot be taken lightly. Ultimately, paying attention to demoralization is crucial to promoting overall wellness in survivors of breast cancer.

**Clinical Implications**

This study found that demoralization plays mediating and suppressive roles in the model involving stress, sleep disturbances, and psychological well-being, which is an important finding for those patients with breast cancer who had completed primary therapy and have been struggling to adapt to their new lives as survivors. This finding echoes previous research that emphasized demoralization findings among women with breast cancer (Kissane & Doolittle, 2013; C. Y. Lee et al., 2012; Robinson et al., 2015). Successfully managing demoralization in survivors of breast cancer will help decrease stressful feelings and death anxiety and improve psychological well-being (Rodin et al., 2018). Kissane and Doolittle (2013) suggested dignity and meaning-centered therapies as models of psychotherapy that focus on alleviating demoralization and also suggested combining interpersonal psychotherapy, behavioral activation strategies, psychodynamic life review, and pharmacological treatment into an effective strategy. Some researchers productively proposed “Moving Beyond Cancer” (Ganz et al., 2004) and “Managing Cancer and Living Meaningfully” (Rodin et al., 2018) as psychological intervention trials to evaluate the physical and psychosocial functioning of patients with breast cancer after primary therapy. These protocols indeed significantly improved the participants’ adjustment efficacy. With respect to the Managing Cancer and Living Meaningfully therapy, the authors showed that demoralization is a good predictor of the effects of the intervention in patients with breast cancer with moderate death anxiety. This anxiety improved 3 months after primary therapy as compared with initial diagnosis and with the end of primary therapy (Rodin et al., 2018). Demoralization should be cautiously evaluated in psychoeducation, individual counseling, and group counseling settings. According to the model in this study, the beneficial effects of stress increase psychological well-being when the patient is coping with demoralization.

This study contributes to the care of patients with breast cancer, especially during the period of adaptation after primary therapy. Patients who have completed primary therapy and are within 5 years of diagnosis have been the least-discussed target group in breast cancer research to date. However, the adaptation process is fluid and chronic and should not be treated the same way as treating post-traumatic stress disorder or in an urgent manner. During surgery, chemotherapy, radiation therapy, and other forms of primary therapy, the physical pain and discomfort are usually the main responses that a patient with breast cancer experiences. Negative moods and other psychological responses during primary therapy are often masked by the physiological pain, making these often not visible and difficult to address. When the primary therapy has ended, along with diminishing physiological responses, the
real psychological adaptation process for patients with breast cancer begins. Therefore, demoralization as a treatable psychological factor should be emphasized in related therapeutic interventions (Robinson et al., 2015).

**Study Limitations**

Despite the benefits of this unique data set and the value of being able to obtain data from SEM, several limitations to this study must be acknowledged. Although the sample comprised a population with characteristics that approximated the average national characteristics in published government statistics, the small sample size and convenient sampling approach may have biased this sample and affected the generalizability of the findings. The evidence reported here suggests that benefit finding associated with having breast cancer and undergoing treatment may have the potential to promote greater psychological well-being over time. It is important to keep in mind that not all patients with breast cancer fit the scenario described in this study. In addition, this study did not include a control group or conduct random sampling. Both should be considered when planning future research. Furthermore, variables such as fear of recurrence are suggested in studies of stress in patients with breast cancer to explore their adaptation. This research used a cross-sectional design, and although the SEM analysis showed that the overall model fitness was acceptable for the relationships among stress, demoralization, sleep disturbances, and psychological well-being, any conclusions regarding causal relationships should be carefully considered. Future research should test the fitness of the model using a longitudinal design or a treatment-intervention design.

**Author Contributions**

Study conception and design: HLP, RHL
Data collection: HLP, HWH
Data analysis and interpretation: HLP, RHL
Drafting of the article: All authors
Critical revision of the article: HLP, RHL

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