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# Learned Resourcefulness, Quality of Life, and Depressive Symptoms for Patients With Breast Cancer

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**B**reast cancer comprises 23% of all cancers affecting women worldwide (Centers for Disease Control and Prevention, 2010) and is one of the leading causes of death for women, particularly in developed countries. In Taiwan, breast cancer is the second-leading cause of cancer-related death among Taiwanese women. The mortality rate is almost 8% and continues to increase (Department of Health of the Executive Yuan, 2001). Women with breast cancer usually report feelings of uncertainty and hopelessness and worse physical symptoms (Northouse et al., 2002) than their healthy counterparts. Aggressive treatments for breast cancer (e.g., surgery, chemotherapy, radiation) usually increase life expectancy but also have an impact on patients' quality of life during survivorship (Northouse et al., 2002). Therefore, the impact of breast cancer may result in different degrees of physical, mental, or social health issues for women with breast cancer (Chen & Ma, 2004).

## Literature Review

Women with breast cancer usually experience multiple progressive physical symptoms and changes in body image, often resulting in psychological distress or depressive symptoms (Northouse et al., 2002). Depression is a comorbidity of breast cancer and its related treatments. Fulton (1998) reported that 16%–25% of women experienced an affective disorder within the first year following mastectomy. Kissane (2004) indicated that 37% of women with early-stage breast cancer had mood disorders, 10% with major depression and 27% with minor depression. Thirty-two percent of patients with breast cancer in the metastasis stage had mood disorders, 7% with major depression and 25% with minor depression (Kissane, 2004). Gaston-

**Purpose/Objectives:** To investigate the relationships among learned resourcefulness, quality of life, and depressive symptoms of women with breast cancer. In addition, the direct and indirect effects of learned resourcefulness among disease characteristics and quality of life and depressive symptoms were examined.

**Design:** Descriptive, correlational, and predictive.

**Setting:** Two teaching hospitals in southern Taiwan.

**Sample:** 150 women with breast cancer.

**Methods:** Participants completed demographic information concerning disease characteristics and learned resourcefulness via the Center for Epidemiological Studies–Depression questionnaire and the SF-36® health survey during visits to the outpatient oncology department.

**Main Research Variables:** Learned resourcefulness, depressive symptoms, and quality of life.

**Findings:** About 35% of the participants had depressive symptoms. Participants with lower income and those undergoing adjuvant therapy displayed more depressive symptoms. Learned resourcefulness was a strong predictor of depressive symptoms and quality of life, but no mediating effects of resourcefulness on depressive symptoms existed. In addition, when participants had better income and were at a lower stage, a better quality of life was evident.

**Conclusions:** A high amount of patients with breast cancer experience depressive symptoms. Learned resourcefulness can be a method of helping patients to improve their self-control behaviors and change their negative thoughts.

**Implications for Nursing:** Nurses and healthcare professionals can apply resourcefulness strategies to promote quality of life and to prevent depressive symptoms in women with breast cancer.

Johansson, Fall-Dickson, Bakos, and Kennedy (1999) indicated that 50% of women with breast cancer experienced depression; Montazeri et al. (2000) reported that 48% have severe symptoms of anxiety before and after diagnosis.

### Quick Facts: Taiwan

**Geography and population:** Taiwan is an island situated in East Asia in the Western Pacific Ocean, located off the southeastern coast of mainland China. Taiwan's population in 2010 was estimated at 23 million.

**Economy:** Taiwan is a capitalist, export-driven economy with gradually decreasing state involvement in investment and foreign trade. In 2010, agriculture constituted only 2% of the gross domestic product.

**Healthcare system:** Health care is administered by the Department of Health of the Executive Yuan. The current system, known as National Health Insurance, was instituted in 1995 and is a single-payer social insurance plan which centralizes the disbursement of healthcare funds. Population coverage reached 99% by 2004.

**Cancer incidence:** Cancer is the leading cause of death in Taiwan at 27.1% of all fatalities. Liver cancer is the most fatal form, followed by lung, colorectal, breast, stomach, and cervical cancers. Taiwan has noted an increase in breast and oral cancers, as well as non-Hodgkin lymphoma.

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Women who were diagnosed with breast cancer experienced some degree of change in their quality of life, particularly for patients undergoing aggressive treatments with related side effects (Schreier & Williams, 2004). Providing information to this patient population is an essential step toward monitoring unwanted side effects and improving patients' quality of life (Osoba, 1990). Learned resourcefulness, defined by Rosenbaum (1990) as an effective coping mechanism, is a set of cognitive-behavioral self-control skills that can improve a patient's ability to deal with stressful events. Therefore, in the current study, the authors applied Rosenbaum's (1990) learned resourcefulness framework to women with breast cancer in southern Taiwan to assess the prevalence of self-reported depressive symptoms and to examine whether learned resourcefulness had mediating effects on the relationship among stress, depressive symptoms, and quality of life.

Measuring quality of life in women with breast cancer also can assess the related treatment outcomes of physical and mental health. Because of the increased prevalence of breast cancer and the longer survival rate of this patient population, the symptoms of aggressive treatments (i.e., full or partial mastectomy and side effects of chemotherapy, radiation therapy, and hormone therapy) may influence quality of life.

Learned resourcefulness is an acquired repertoire of behaviors by which a person self-regulates internal responses that interfere with the smooth execution of a

target behavior. These behaviors are learned from birth (often modeled by parents, peers, and educators) and serve as a basis for additional learning. A high degree of learned resourcefulness can help individuals regulate the disruptive effects of negative events, such as cancer diagnosis and treatment, and the accompanying comorbidities such as depression and anxiety, negative cognitions, phobic reactions, and physical pain (Rosenbaum, 1990). Huang, Susan, Tu, and Hwang (2005) reported that adolescents with higher learned resourcefulness showed fewer depressive symptoms. Similarly, Huang et al. (2007) reported that patients with diabetes that had higher learned resourcefulness were more likely to have lower depressive symptoms. Ruff (2000) conducted research on the learned resourcefulness concept in women with breast cancer and found patients with high learned resourcefulness reported higher self-esteem and well-being. However, no known studies have been conducted on learned resourcefulness related to depressive symptoms or health-related quality of life in women with breast cancer in Taiwan.

## Conceptual Model

Learned resourcefulness was used as a framework to help people use internal processes, including cognitions, emotions, and sensations to perform their daily activities. Extensive research has detailed the experiences of patients with breast cancer, including uncertainty, depressive symptoms, and quality of life (Gaston-Johansson et al., 2000). The aim of this study was to investigate the relationships among learned resourcefulness, quality of life, and depressive symptoms of women with breast cancer. The following research questions were posed for investigation.

- Do statistically significant associations exist among demographic factors (i.e., age, education, and household income), disease characteristics (i.e., duration, disease severity, and adjuvant therapy), learned resourcefulness, quality of life, and depressive symptoms?
- Controlling for age, education, and household income, what are the effects of stressors (i.e., duration, disease severity, and adjuvant therapy) on quality of life and depressive symptoms of patients with breast cancer?
- Does learned resourcefulness mediate stressors (i.e., duration, disease severity, and adjuvant therapy), quality of life, and depressive symptoms of patients with breast cancer?

## Methods

A descriptive correlation design was used to examine the relationships among demographic factors, disease characteristics, learned resourcefulness, quality of life, and depressive symptoms of patients with breast cancer.

A survey was conducted with a sample of 150 patients with breast cancer to determine the effects of learned resourcefulness on quality of life and depressive symptoms. Mediating effects of learned resourcefulness also were examined. An adequate sample size was considered for correlation and regression analysis to achieve a power of 0.8, a medium effect size of 0.15, and an  $\alpha$  level of 0.05 (Cohen, 1988). Selecting reliable measurements reduced threats to validity. The sample size was calculated according to a power analysis suggested by Cohen (1988). In addition, the current study used correlation and multiple regression. Adequate sample size was more appropriate and powerful. Keeping in mind that missing data might occur during data collection, the investigator recruited more than 150 participants, with a 20% risk of a type II error, and a 5% risk of a type I error.

## Sampling Method

The participants in this study were aged 18–65 and were diagnosed with breast cancer. A list of potential study participants was provided by the administration department of two hospitals in southern Taiwan. Inclusion criteria for the study consisted of being diagnosed with breast cancer, being able to understand or communicate in Chinese or Taiwanese, and accepting the research methods.

## Data Collection

Approval for the study was obtained from the institutional review boards of two hospitals in southern Taiwan. After gaining approval, the principal investigator conducted face-to-face interviews with the participants in a breast cancer outpatient department. Each participant spent 30 minutes in the interview. All participants were informed of the study and then asked to sign a written consent form. The response rate was about 97%. Five potential participants refused because of time constraints, feeling depressed, or interview fatigue.

## Instruments

The demographic information sheet was used to measure specific data, such as age, education, and household income, and stressor variables, such as duration, disease severity, and adjuvant therapy. All demographic data were measured by self-report. In addition, duration of months was calculated since diagnosis of breast cancer, and disease severity was categorized as 0, I, II, III, or IV. Adjuvant therapy, including radiation therapy or chemotherapy, was reported by physicians.

Depressive symptoms were measured via the **Center for Epidemiological Studies–Depression (CES-D)** scale (Radloff, 1977). The CES-D is a 20-item scale. Participants are asked to rate, on a four-point scale (0 = rarely or none

**Table 1. Sample Characteristics**

Characteristic	$\bar{X}$	SD
Age (years)	51.6	10.4
Duration of breast cancer (months)	32.88	41.5
Learned resourcefulness (scale scoring)	38.9	32
Characteristic	n	%
<b>Marital status</b>		
Married or cohabitating	115	77
Widowed	17	11
Divorced	8	5
Single	7	5
Separated	3	2
<b>Education (years in school)</b>		
None	17	11
Less than 6	42	28
6–9	26	17
10–12	44	29
More than 12	20	13
Not reported	1	1
<b>Monthly income (in New Taiwan \$)</b>		
Less than 25,000	48	32
25,001–50,000	38	25
50,001–75,000	33	22
More than 75,000	31	21
<b>Disease stage</b>		
0	19	13
I	40	27
II	69	46
III	19	12
IV	3	2
<b>Adjuvant treatment</b>		
Yes	111	74
No	39	26

N = 150

Note. Because of rounding, not all percentages total 100.

of the time, 1 = some or little of the time, 2 = occasionally or a moderate amount of time, 3 = most or all of the time) how frequently they had experienced certain symptoms or feelings during the previous week. Scores ranged from 0–60, with higher scores reflecting greater depressive symptoms. The overall score was the sum of all ratings, with higher scores indicating more depressive symptoms. Scores of CES-D at or above 16 were considered as a risk for clinical depression (Radloff, 1977). The Cronbach- $\alpha$  coefficient for this study was 94.

Learned resourcefulness was measured with the **Self-Control Schedule (SCS)** (Rosenbaum, 1990). The SCS consists of 36 items, ranked on a six-point scale, indicating the extent to which individuals evaluate the item as the characteristics of themselves (i.e., -3 = very uncharacteristic of me, and +3 = very characteristic of me). The overall score was the sum of all ratings, with higher scores indicating more learned resourcefulness. Eleven items (4, 6, 8, 9, 14, 16, 18, 19, 21, 29, 35) were reversed, with the range of scores running from -108 to +108. For general populations, the score averages +25, with a standard deviation of 20. Reliability and validity

have been well established, and reported internal consistency estimates ranged from 0.78–0.95. In addition, the reliability of this measure has been well established in previous studies (Rosenbaum, 1990). The Cronbach- $\alpha$  coefficient was 0.79 in Huang et al. (2005), and was 0.88 for the current study.

The SF-36<sup>®</sup>, an easy-to-complete questionnaire, had been shown to be a reliable and valid instrument (McHorney, Ware, & Reczek, 1993; Ware & Sherborne, 1992). Because of the brevity of SF-36, the instrument has been widely used among diverse populations internationally, including in the United States, Germany, Spain, France, Taiwan, and Japan (Krongrad et al., 1997). Content validity has been established. The SF-36 serves as a measure of health-related quality of life, which includes eight subscales relevant to the general health of the individual: physical functioning, role limitations (issues with work or other daily activities as a result of physical health or emotional problems), bodily pain, social functioning, general mental health, vitality, energy or fatigue, and general health perceptions. The Cronbach- $\alpha$  coefficient ranged from 0.75–0.89 for each subscale.

## Data Analysis

After performing the preliminary data analysis, the main data analysis was run by using SPSS<sup>®</sup> 15.0 to test three research questions. For descriptive statistical analysis, summary statistics for each variable were obtained to examine the shape of the distribution (normal, skewness, kurtosis), central tendency (mean, median, mode), and dispersion (range, variance, standard deviation) of the scores. Therefore, Pearson's *r* correlation, *t* test, and analysis of variance were used for testing the first research question; multiple regression was used to test the remaining two research questions. The value of statistical significance was  $\alpha = 0.05$ .

## Results

### Characteristics of the Sample and Study Variables

The characteristics of the sample and study variables are shown in Table 1. The majority of participants were married with an average age of 51.6 years. The average duration of their breast cancer was 32.88 months. In addition, the mean for learned resourcefulness was 38.9 and the standard deviation was 32, which indicated that the learned resourcefulness of participants was higher than the general population based on Rosenbaum (1990).

### Prevalence of Depressive Symptoms

Regarding the results of depressive symptoms, the mean CES-D score was 15.58 (SD = 13.43). Scores of CES-D scale at or above 16 were considered at risk for clinical depression. In the current study, about 35% of participants scored higher than 16.

### Relationships Among the Variables

As shown in Tables 2, 3, and 4, the age of participants was negatively related to their physical and overall quality of life with weak correlation ( $r = -0.229$ ,  $p \leq 0.01$ ;  $r = -0.186$ ,  $p \leq 0.05$ , respectively). In addition, age of participants had a weakly positive relationship with depressive symptoms ( $r = 0.185$ ,  $p \leq 0.05$ ), and had a weakly negative relationship with learned resourcefulness ( $r = -0.315$ ,  $p \leq 0.01$ ). Education of participants had a weakly positive relationship with their physical and overall quality of life ( $r = 0.297$ ,  $p \leq 0.01$ ;  $r = 0.235$ ,  $p \leq 0.01$ , respectively), and also had a weakly positive relationship with learned resourcefulness ( $r = 0.277$ ,  $p \leq 0.01$ ). Duration of the disease had a significantly negative relationship with participants' overall quality

**Table 2. Correlations Among Independent Variables, Learned Resourcefulness, Depressive Symptoms, and Quality of Life**

Variable	Age	Education	Duration	Income	Disease Severity	Depressive Symptoms	PHQOL	MHQOL	OQOL	LR
Age	1	–	–	–	–	–	–	–	–	–
Education	–0.513**	1	–	–	–	–	–	–	–	–
Duration	0.143	–0.154	1	–	–	–	–	–	–	–
Income	–0.291**	0.431**	–0.084	1	–	–	–	–	–	–
Disease severity	–0.024	–0.052	0.124	–0.054	1	–	–	–	–	–
Depressive symptoms	0.185*	–0.139	0.158	–0.247**	0.142	1	–	–	–	–
PHQOL	–0.229**	0.297**	–0.324**	0.322**	–0.324**	–0.565**	1	–	–	–
MHQOL	–0.121	–0.054	–0.199*	0.265**	–0.199*	–0.714**	0.741**	1	–	–
OQOL	–0.186*	0.235**	–0.278**	0.314**	–0.278**	–0.688**	0.928**	0.937**	1	–
LR	–0.315**	0.277**	0.086	0.244**	0.042	–0.569**	0.413**	0.517**	0.5**	1

\*  $p \leq 0.05$ ; \*\*  $p \leq 0.01$  (two-tailed)

LR—learned resourcefulness; MHQOL—mental health component of QOL; OQOL—overall QOL; PHQOL—physical health component of QOL; QOL—quality of life

**Table 3. Differences Between Sample Characteristics and Quality of Life**

Variable	n	$\bar{X}$	SD	Statistic
<b>Marital status</b>				F = 1.732 <sup>a</sup>
Married or cohabitating	115	506.24	179.79	
Widowed	17	411.88	168.29	
Divorced	8	437.06	147.62	
Single	7	555.67	186.7	
Separated	3	384.56	218.71	
<b>Adjuvant treatment</b>				t = 0.121
Yes	111	478.23	180.29	
No	39	530.18	174.85	
<b>Religion</b>				t = 0.58
Yes	140	489.55	178.53	
No	10	522.3	204.49	

N = 150

<sup>a</sup> Married is greater than widowed,  $p \leq 0.05$ .

of life. Household income had a significantly weak negative relationship with depressive symptoms but weakly positive relationships with physical, mental, and overall quality of life and learned resourcefulness. Regarding adjuvant treatment, significantly lower mean scores existed for depressive symptoms for participants with adjuvant treatment than those without adjuvant treatment ( $t = -2.242$ ;  $p = 0.026$ ), but no differences were noted in quality of life. For disease severity, negative relationships were evident among stage and physical ( $r = -0.324$ ,  $p \leq 0.01$ ), mental ( $r = -0.199$ ,  $p \leq 0.05$ ), and overall quality of life ( $r = -0.278$ ,  $p \leq 0.01$ ) with weak correlations. Depressive symptoms of participants had a moderate negative relationship with learned resourcefulness ( $r = -0.569$ ,  $p \leq 0.01$ ), and moderate negative relationships with physical ( $r = -0.565$ ,  $p \leq 0.01$ ), mental ( $r = -0.714$ ;  $p \leq 0.01$ ), and overall quality of life ( $r = -0.688$ ,  $p \leq 0.01$ ). On the contrary, learned resourcefulness had a significantly moderate positive relationship with physical ( $r = 0.413$ ,  $p \leq 0.01$ ), mental ( $r = 0.517$ ,  $p \leq 0.01$ ), and overall quality of life ( $r = 0.5$ ;  $p \leq 0.01$ ).

### Effects of Learned Resourcefulness on Depressive Symptoms

Multiple and hierarchical regressions were used to examine the effects of demographic factors, such as age, education, and household income, and disease characteristics, such as duration, disease severity, and adjuvant therapy, on depressive symptoms and quality of life. As shown in Table 5, the model explained 9% of the variance in depressive symptoms. Among the stressor variables, monthly income and adjuvant therapy were significant predictors on depressive symptoms of participants.

A hierarchical regression was performed to examine the effect of learned resourcefulness on depressive symptoms after controlling for the effect of the stressor variables. This second model explained 37% of the

variance in depressive symptoms. Learned resourcefulness was a strong predictor of depressive symptoms ( $\beta = -0.565$ ,  $p = 0.001$ ).

### Effects of Learned Resourcefulness on Quality of Life

Multiple and hierarchical regressions were used to examine the direct effects of demographic factors and disease characteristics on quality of life. As shown in Table 6, the model explained 15% of the variance on quality of life. Among the stressor variables, income ( $\beta = 0.241$ ,  $p = 0.005$ ) and stage of breast cancer ( $\beta = -0.21$ ,  $p = 0.012$ ) were significant predictors on quality of life among participants.

A hierarchical regression was performed to examine the effect of learned resourcefulness on depressive symptoms after controlling for the effect of the stressor variables. This second model explained 33% of the variance in quality of life. Learned resourcefulness was a strong predictor of quality of life ( $\beta = 0.457$ ,  $p = 0.001$ ).

### Mediation Effect of Learned Resourcefulness Between Stress and Outcome Variables

To test whether learned resourcefulness played a role in mediating duration (e.g., disease severity, adjuvant therapy) and anxiety, depression, and quality of life, the three equations used for each were (a)  $t = b_1x$ , (b)  $y = b_2x$ , and (c)  $y = b_3x + b_4t$ , where "t" was the mediating variable (learned resourcefulness), x was the independent variable (duration, disease severity, and adjuvant therapy), and y was the dependent variable (depressive symptoms and quality of life). If learned resourcefulness was a mediator, all three equations should be significant;  $b_3$  must be less than  $b_2$  (Gogineni, Alsup,

**Table 4. Differences Between Sample Characteristics and Depressive Symptoms**

Variable	n	$\bar{X}$	SD	Statistic
<b>Marital status</b>				F = 1.732 <sup>a,b</sup>
Married or cohabitating	115	14.98	13.53	
Widowed	17	22.35	13.67	
Divorced	8	12.5	9.12	
Single	7	8.43	4.43	
Separated	3	25	19.97	
<b>Adjuvant treatment</b>				t = -2.242*
Yes	111	478.23	180.29	
No	39	530.18	174.85	
<b>Religion</b>				t = -0.628
Yes	140	13	8.1	
No	10	15.76	13.73	

N = 150

\*  $p \leq 0.05$ <sup>a</sup> Widowed is greater than single,  $p \leq 0.05$ .<sup>b</sup> Widowed is greater than married,  $p \leq 0.05$ .

**Table 5. Depressive Symptoms Regressed on Demographic and Disease Characteristics**

Variable	Model A $\beta$	Model B $\beta$
Constant	2.696	15.618
Age	0.175	0.041
Education	0.039	0.108
Income	-0.225*	-0.149
Duration	0.01	0.089
Disease severity	0.064	0.096
Adjuvant treatment	0.2*	0.171
Learned resourcefulness	–	-0.565**
R <sub>2</sub>	0.128	0.397
Adjusted R <sub>2</sub>	0.092	0.368
F change	3.501	63.452

\*  $p \leq 0.05$ ; \*\*  $p \leq 0.001$

Note. Model A includes studied variables without learned resourcefulness. Model B incorporates learned resourcefulness.

& Gillespie, 1995). In addition, if a complete mediator effect existed,  $b_3$  must be nonsignificant. Because the first equation was not significant, no mediation effect of learned resourcefulness occurred in this study.

## Discussion

The current study was the first conducted on the impact of learned resourcefulness on the quality of life of women with breast cancer in Taiwan. Learned resourcefulness was applied to measure how well people adjusted themselves to the treatment situations or survival period. Patients with breast cancer having higher learned resourcefulness had lower depressive symptoms and a better quality of life. In regard to age, adult participants (ages 23–83) had less learned resourcefulness, worse quality of life, and higher depressive symptoms than younger participants, which indicated that nurses should consider the relationship between age and outcomes. Older patients with breast cancer may need more specific care and attention.

Significantly higher mean scores of depressive symptoms also were noted for participants without adjuvant treatment compared to participants with adjuvant treatment; however, no difference existed in quality of life, which was consistent with Schreier and Williams (2004).

Stage II was the most common stage of the participants' breast cancer and, in this stage, patients generally receive surgery and/or adjuvant treatments. The majority of participants was aged 45–55 years and in need of additional treatment.

Breast cancer treatments usually involve surgery and adjuvant therapy; however, these treatments can have serious repercussions, such as depression, marital issues, and diminished quality of life (Broeckel, Jacobsen, Balducci, Horton, & Lyman, 2000; Burgess, Ramirez, Richards, & Potts, 2002; Schreier & Williams,

2004). The current study demonstrated the prevalence of depressive symptoms in about 35% of patients with breast cancer. Kissane et al. (2004) indicated that 45% of early-stage patients with breast cancer had some kind of psychiatric diagnosis, 42% for patients with metastasis. Previous studies also have indicated that 30% of women with breast cancer having surgery or adjuvant treatments usually experience persistent distress for one year or more, which results in negative consequences such as sleep disturbances, anxiety, depressive symptoms, and divorce (Chung, Ku, Wu, Chao, & Yang, 2001; Goodwin, Zhang, & Ostir, 2004; Schreier & Williams, 2004). Regarding the type of treatment or surgery, no evidence existed of a specific treatment causing mental morbidity for patients with breast cancer. However, a study was conducted which reported that patients with malignancies had a greatly diminished quality of life (Yen et al., 2006).

According to the current study, education had a positive relationship with participants' overall quality of life and learned resourcefulness. This indicated that participants with lower education had lower quality of life.

For patients with breast cancer, the disease is an unfamiliar situation and may require some thinking and cognitive efforts. When an individual is engaged in controlled actions, he or she also is engaged in process-regulating cognitions (Rosenbaum, 1990). Nurses may apply this research to their practice by being aware of patients' level of learned resourcefulness. This may, in turn, help to build a self-control and self-care intervention based on a need to promote participants' knowledge on an individual basis.

## Limitations

A number of methodological limitations existed in this study. First, the cross-sectional design made it difficult

**Table 6. Quality of Life Regressed on Demographic and Disease Characteristics**

Variable	Model A $\beta$	Model B $\beta$
Constant	534.815	394.77
Age	-0.106	0.003
Education	0.091	0.035
Income	0.241**	0.18*
Duration	0.086	0.022
Disease severity	-0.21*	-0.236**
Adjuvant treatment	-0.079	-0.056
Learned resourcefulness	–	0.457***
R <sub>2</sub>	0.185	0.362
Adjusted R <sub>2</sub>	0.151	0.33
F change	5.423	39.269

\*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

Note. Model A includes studied variables without learned resourcefulness. Model B incorporates learned resourcefulness.

to conclude that learned resourcefulness and quality of life had a causal relationship. Future studies using prospective design are recommended. Second, the current study used a convenience sample to collect data and identify the deficiency of learned resourcefulness of participants; however, bias may have existed and generalizability was limited. Finally, the sample was voluntary and might be less than representative of the population, which is a threat to external validity (Cook & Campbell, 1979). The types of surgery methods and adjuvant treatments used should be more specific for comparison.

For future study, the authors plan to conduct an intervention of learned resourcefulness to increase behavioral control for patients with breast cancer with higher scores of depressive symptoms (or lower than average of quality of life) following multiple time points. In addition, the design would be a prospective and experimental study. The researcher could extend the settings to different locations, such as the central, eastern, or northern sections of Taiwan.

## Implications for Nursing

A high percentage of depressive symptoms occur in women with breast cancer; therefore, nurses should strive to prevent and detect the depressive symptoms. This may be particularly important for patients who are not receiving adjuvant treatments because of a terminal status and, therefore, may need additional support.

Learned resourcefulness has positively moderate relationships with physical and mental issues and overall quality of life, and negatively moderate relationship with depressive symptoms in patients with breast cancer. Therefore, using self-control skills (learned resourcefulness) is helpful for patients striving to adapt to their survivorship. Nurses can help patients build self-control skills through self-care and self-help strategies.

## Conclusion

Where the high prevalence of depressive symptoms of breast cancer occurred, as well as other negative impacts on quality of life, teaching self-control skills for patients with breast cancer to achieve learned resourcefulness can be seen as a coping method. According to the data, most patients cannot make appropriate healthcare decisions when bogged down with depressive symptoms. A lack of learned resourcefulness may influence patients' experience with breast cancer. To achieve learned resourcefulness, therefore, self-control behaviors that are the necessary skills and routines in a basic behavioral repertoire must be taught. The skills and behaviors that are required for the successful execution of reformative self-control behaviors should be defined (Rosenbaum, 1990). Nurses can help patients in two areas: helping patients cope with their physical discomforts, such as nausea, vomiting, sleeping disorders, or fatigue; and helping patients adopt health behaviors which require reformative self-control. Learned resourcefulness is a set of well-learned behaviors and skills by which a person self-controls his or her behavior. Nurses can help women with breast cancer execute their self-care (including physical and mental care), attend supportive groups, and change their negative thoughts so as to prevent depressive symptoms and enhance their quality of life.

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