

Effectiveness Of an Educational Intervention to Improve Coping Strategy and Quality of Life Among Primary Caregivers of Jordanian Women with Breast Cancer.

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Abstract

BC is a significant health issue that affects individuals regardless of culture, race, gender, and economic and social status. The impact of BC is not only limited to the quality of life (QOL) and coping strategies among women but also their primary Caregivers (PCs). The care of women with BC includes physical, psychological, social, and environmental aspects and their ability to utilize positive coping strategies, i.e., problem- and emotion-focused strategies. Studies have demonstrated that the psychosocial well-being of PCs of patients undergoing care and treatment for BC in Jordan has received a limited amount of attention. Even though this group of people is confronted with psychological challenges, there are no interventions in place to cater to their requirements. This study aims to develop, implement, and evaluate the effectiveness of an educational intervention to improve coping strategies and QOL among PC for BC women in Jordan. The study methodology employed a quantitative and descriptive approach to investigate the connections between the dependent variables, namely coping strategies and QOL, and the independent factors, which encompass demographics and caregiving burden. The study was a randomized controlled trial with two arms: the control group, which received standard treatment alone, and the intervention group, which received an intervention program in addition to standard care. The intervention was implemented to assess its impact. Multiple variables were analyzed during three distinct periods. The study was conducted in selected public hospitals of Jordan. A prior power analysis was performed to determine the sample size based on a comparative study. A total of 31 primary PCs were selected from each hospital using inclusion eligibility, totaling 124.

Data were collected in three phases: baseline, post-test, and 12-week follow-up. The multi-teaching topics covered in the educational intervention were introduction and information about BC and assisting the participants in adjusting to being a primary caregiver, problem-focused strategy, emotion-focused strategy, and QOL domains and practical care. The sessions were held on a single day and lasted between 30 and 70 minutes. SPSS version 23.0 was used to analyze the data. Socio-demographic characteristics, overall QOL, and physical, psychological, social, and environmental domains did not differ significantly between the groups at baseline. However, post-intervention comparisons revealed a significant mean difference between intervention and control groups for overall quality of life. These findings reflect the effectiveness of an educational intervention utilizing multi-teaching strategies and comprehensive components in improving QOL and coping strategies among PC for women with BC in Jordan. Policymakers could utilize and implement the low-cost educational intervention with significant effects on the QOL and coping strategies among PC in public hospitals in Jordan. The provision of intervention programs for PC necessitates additional research to develop programs and services that are contextually specific and will improve the QOL of PCs. It is important to provide suitable supportive interventions to assist the immediate family members of BC patients to lessen the strain on PCs. Key stakeholders in the healthcare industry, particularly in palliative care, should actively advocate for increased awareness of the needs of PCs. Additional research is needed to provide intervention programs and services tailored to the individual needs of PCs, to enhance their QOL.

Keywords: Educational intervention, Coping strategy, Quality of life, Primary caregiver, Jordan BC women

1. Introduction

Breast cancer (BC) is not just a local concern but a significant global health issue. It is the most common malignant disease affecting females of all racial origins, transcending culture, race, economic, gender, and social status (Iddrisu, Aziato, & Ohene, 2021). It is the second-leading cause of death worldwide after lung cancer (Azamjah, Soltan-Zadeh, & Zayeri, 2019; Siegel, Miller, & Jemal, 2017). BC is the most prevalent type of cancer among Jordanians, representing 20.8% of the cancer affecting both genders and 38.9% of those documented in females (Jordan Cancer Registry & Registry, 2018). The increasing prevalence and incidence rates of BC in Jordan are also reflected in the high mortality rate (24.9%) (Jordan Cancer Registry & Registry, 2018).

In the past decade, significant developments have been made in the approach to BC, particularly focusing on less invasive surgeries and individualised treatment. Overall, cancer therapy requires combining one or more therapeutic or management techniques, thereby increasing the chances of recovery, reducing anatomical losses, and preserving the function of compromised organs (Arruebo et al., 2011).

For instance, during chemotherapy, BC patients manifest adverse symptoms such as reduced self-esteem depression and financial and physical losses (Mourao et al., 2017). Thus, women living with BC need to adapt to psychological, social, physical, financial, and emotional changes, and coping with the disease requires social support (Younis, Norsa'adah, & Othman, 2021).

Primary caregivers (PCs) are the unsung heroes in the battle against BC. They provide practical and emotional support, and their role is crucial in the management of BC patients during and after diagnosing the disease. Their substantial social support in stressful conditions has been shown to lower adverse impacts on social well-being and health (Reblin et al., 2023).

Nevertheless, the increasing demand for caregiving has led to the recruitment of a higher proportion of PCs with little or no training, thereby impacting their tasks and responsibilities toward BC patients (K. Lim, Lee, Lim, Kim, & Lee, 2013; Romito, Goldzweig, Cormio, Hagedoorn, & Andersen, 2013). The upward trend of caregiving functions contributes to higher stress levels and burnout among caregivers, leading to a decline in coping strategies (Kim, Spillers, & Hall, 2012; K. Lim et al., 2013) and overall quality of life (QOL) (Lim et al., 2017; Liu, Ye, Jiang, Zhong, & Zou, 2023).

BC impacts the affected individuals and their immediate caregivers. In Jordan, as in many parts of the world, the burden of caregiving for individuals diagnosed with BC falls predominantly on family members, mainly primary caregivers. The emotional, psychological, and physical toll that caregiving exacts on these individuals can profoundly affect their coping strategies (Perez-Ordóñez, Frías-Osuna, Romero-Rodríguez, & del-Pino-Casado, 2016; Teixeira, Applebaum, Bhatia, Brandao, & Brandão, 2018) and overall QOL (Lim et al., 2017; Mahendran et al., 2017).

Recognizing the critical role of PCs in the BC journey, interventions to enhance their coping strategies and QOL have gained prominence in recent years (Badger, Segrin, Hepworth, et al., 2013; Bahrami & Farzi, 2014; Matthys et al., 2021; Pang, Jin, & Wang, 2022).

Therefore, this cluster randomized controlled trial (CRCT) aimed to evaluate the effectiveness of an educational intervention on coping strategies and QOL among PCs of Jordanian women with BC.

1. Materials and Methods:

The research utilised a cluster randomised controlled trial (CRCT) design to evaluate the effectiveness of an educational intervention in enhancing coping strategies and QOL among PCs of Jordanian women diagnosed with BC. The sample comprised 124 PCs of Jordanian women with BC. Hospitals were selected from public health, including four hospitals with outpatient services.

A prior power analysis was performed to determine the sample size based on a comparative study. The sample size for this study was calculated to achieve a power of 0.80 with an alpha significance of 0.05 (2-tailed). The sample size for the primary outcome was calculated based on the formula by Lemeshow, Hosmer, Klar, & Lwanga, (1990). The sample size for PC is based on a previous intervention study (Farahani, Maarefvand, Biglarian, & Khubchandani, 2016) to estimate the sample size of PC QOL in each group.

The inclusion criteria were PCs aged 18 years or older, able to read and write in Arabic, and PCs who provided care and lived with the woman with BC for at least six months before the study. Also, the exclusion criteria were: PCs who are professionally trained or work as healthcare providers or care for an inpatient and have previously participated in the intervention research (e.g., cognitive behaviour therapy or psycho-educational intervention).

All variables were assessed using self-report questionnaires. The variables included socio-demographic, coping strategy, and QOL. The coping strategy was measured using the Brief Cope Inventory (BCI) (Nawel & Elisabeth, 2015).

QOL was measured using the WHOQOL-BREF Scale Arabic version (WHOQOL-BREF) (World Health Organization, 1998). The researcher developed the demographic questionnaire. The questionnaire had 11 items to determine the primary caregiver's resources (income and insurance type), the primary caregiver's characteristics (age, gender, educational level, work,

and marital status), and the patient’s characteristics (age, relationship, cancer stage, and treatment modalities).

QOL was measured using the WHOQOL-BREF Scale Arabic version (World Health Organization, 1998). It is used to assess the QOL among cancer caregivers and is widely used to assess the QOL domains (physical, psychological, spiritual, and environmental). The WHOQOL-BREF consists of 26 self-reported items by the primary caregiver. The instrument is divided into four domains, i.e., physical, psychological, social relationships, and environmental. The instrument consists of 26 Likert-style questions on a 5-point scale ranging from 1 = very good to 5 = very poor.

The BCI is a condensed version of the original 60-item COPE inventory. The examination consists of 28 items divided into 14 subscales: self-distraction (items 1–19), active coping (items 2–7), denial (items 3–8), substance use (items 4–11), use of emotional support (items 5–15), use of instrumental support (items 10–23), behavioural disengagement (items 6–16), venting (items 9–21), positive reframing (items 12–17), planning (items 14–25), humour (items 18–28), acceptance (items 20–24), and religion (items 22–27). Items were graded on a 4-point Likert scale, with one being “I have never used this at all” and four being “I have used it a lot” (Carver, 1997).

The items in the BCI were divided into problem-focused items (active coping, use of instrumental support, and planning), and the rest of the items were considered emotion-focused strategies (Kurowska, Kózka, & Majda, 2021; Macdonald, 2011; Noureen, Ali, Muhammad, & Shah, 2019).

In this study, the outcome variables (QoL, coping strategy) were measured in three phases: baseline before randomization (Time 1), on the same day of baseline data collection, a summarised video of the educational programme shared after the face-to-face educational programme was presented, and the post-tests in Time 2—after the educational programme) and the 12th week after intervention (Time 3). Two post-tests were applied to ensure the examination of the efficacy of the educational programme.

Randomization was taken using random sequence number generation to randomise at the hospitals, and a list was brought up for all eligible hospitals. The intervention or control groups (1:1) were allocated equally to the hospitals. The four hospitals were numbered sequentially (1–4). The odd numbers (1 and 3) were taken as the intervention hospitals, and the even numbers (2 and 4) were considered the control hospitals from the random sequence number generation. This study consists of 124 PCs of women with BC who signed the consent form.

Each Interventive groups received the educational program which consisted of four sessions as demonstrated in table 2. Also, the control groups received Non-communicable disease program as shown in table 2. After completion the sessions summarised video of the sessions were shared with participants.

Table 1. Educational and Supported program

Sessions	Experimental groups	Session Time	Control groups	Session Time

First session	Introduction and information about BC and assisting the participants adjust to being PC	70 minutes	Hypertension	60 minutes
Second Session	Problem-focused strategy	60 minutes	Diabetes Mellitus	45 minutes
Third Session	Emotion-focused strategy	50 minutes	Asthma	45 minutes
Fourth Session	QOL domains and practical care	60 minutes	Chronic Obstructive Pulmonary Disease	50 minutes

Ethical approval was obtained from relevant institutional review boards. Informed consent was obtained from participating PCs. Confidentiality and anonymity were maintained throughout the study. CRCT registration (IRCT20200708048056N1).

2. Result

Descriptive statistics summarized the characteristics of participants. Differences in mean scores of coping strategies, and QOL between the intervention and control groups were analyzed using *t*-tests. A Multivariate Analysis of Variance (MANOVA) assessed differences in outcomes across multiple time points. Statistical significance was set at $p < 0.05$.

The data were subjected to normality tests using the level of skewness and kurtosis based on the threshold values of -1.96 to +1.96 as described by Hair, Hollingsworth, Randolph, & Chong, (2017). Independent *t*-test, and chi-square test showed no significant difference between the two groups of study concerning socio-demographic characteristics (Tables 1 and 2). Independent *t*-test showed no significant difference between the mean scores of QOL and coping strategy scores before intervention (Table 3).

The independent *t*-test results showed a significant difference between the intervention and control groups in the post-test and follow-up assessments. Following the intervention, the mean scores for the intervention group were notably higher compared to the control group, indicating a positive impact of the educational intervention on the participants. This significance was sustained at the follow-up test, suggesting that the benefits of the intervention lasted over time, as shown in tables 4 and 5.

The MANOVA results showed significant findings, indicating that the educational intervention had a substantial multivariate effect on the dependent variables across the post-test and follow-up tests. The significant MANOVA results suggest that the intervention not only improved individual outcomes but also had a broad impact on coping strategies and QOL of the participants, as shown in tables 6, 7, and 8.

Table 1 : Distribution of socio-demographic background at the baseline (n = 124)

Socio-demographic background	Intervention group (n= 62, %)	Control group (n= 62, %)	Test-statistic (Chi-square a/ t)	p-value
PC's gender				
Male	19 (30.6)	17 (27.4)	0.157 ^a	0.69
Female	43 (69.4)	45 (72.6)		
PC's age (mean± sd)	40.08 ± 11.67	42.44 ± 12.5	-1.08 ^b	0.28
Insurance				
Public	58 (93.5)	53 (85.5)	2.148 ^a	0.14
Private	4 (6.5)	9 (14.5)		
Education level				
Secondary school or less	15 (24.2)	21 (33.9)		
Graduate degree	36(58.1)	33 (53.2)		
Post Graduate degree	11(17.7)	8(12.9)		
Monthly income (JOD*) (mean ± sd)	468.63 ± 224.07	486.85 ± 186.52	-0.492 ^b	0.623
Social status			0.393 ^a	0.822
Single	15(24.2)	28(22.6)		
Married	40(64.5)	40(64.5)		
Divorced or widowed	7 (11.3)	9(14.5)		
Relationship			2.033 ^a	0.154
Family	60 (96.8)	62 (100.0)		
Friend	2 (3.2)	0.0(0.0)		

Note: N = number, % = percentage, a = Chi-square test, b = independent sample test, m = mean, sd = Standard Deviation, * JOD 1 = USD 1.41 = RM 5.92

Table 2: Distribution of Socio-Demographic background of the patients (N=124)

Variables	Intervention group (n = 62, %)	Control group (n = 62, %)	Test-statistic (Chi-square / t)	p-value
Patient's age (mean ± sd)	51.23±7.57	52.24±8.97	-0.86 ^b	0.49

BC stages			1.62 ^a	0.687
Stage 1 & 2	46 (74.2)	44 (71.0)		
Stage 3 & 4	16 (25.8)	18 (29.0)		

Note: *N*= number, % = percentage, *a* = Chi-square test, *b* = independent sample test, *m* = mean, *sd* = Standard Deviation

Table 3: QOL, QOL domains, and coping strategies mean differences between groups at baseline (N=124)

Dependent variables	Intervention group <i>mean ± sd</i>	Control group <i>mean ± sd</i>	<i>t</i> -value	<i>p</i> -value
QOL overall	54.61 ± 8.00	56.33 ± 7.88	-1.20	0.232
Physical	59.61 ± 11.18	62.96 ± 15.70	-1.37	0.173
Psychological	55.37 ± 10.93	55.45 ± 13.53	-0.036	0.971
Social	57.12 ± 21.17	57.25 ± 17.41	-.037	0.970
Environmental	46.35 ± 12.17	49.64 ± 12.15	-1.50	0.135
Problem-focused coping	10.05 ± 2.46	10.69 ± 1.92	-1.62	0.107
Emotion-focused coping	41.24 ± 4.58	41.19 ± 4.39	0.06	0.952

Note: *p* values < .05, *t* = independent sample test, *m* = mean, *sd* = Standard Deviation, QOL = QOL

Table 4: QOL, QOL domains, and coping strategies mean differences between groups post-intervention (n = 124)

Dependent variables	Intervention group <i>mean ± sd</i>	Control group <i>mean ± sd</i>	<i>t</i> -value	<i>p</i> -value
QOL overall Post-intervention	66.27 ± 5.30	56.83 ± 6.51	8.84	< 0.001*
Physical Post-intervention	72.32 ± 6.45	62.66 ± 14.57	4.77	< 0.001*
Psychological Post-intervention	68.04 ± 7.41	56.05 ± 13.21	6.76	< 0.001*
Social Post-intervention	69.21 ± 11.40	58.98 ± 15.94	4.11	< 0.001*

Environmental Post-intervention	55.52 ± 10.39	49.92 ± 11.43	2.94	0.004*
Problem-focused coping				
Post-intervention	15.52 ± 2.01	11.28 ± 2.17	11.23	< 0.001*
Emotion-focused coping				
Post-intervention	55.85 ± 4.21	41.35 ± 4.59	15.55	< 0.001*

Note: *p* values < .05, *t* = independent sample test, *m* = mean, *sd* = Standard Deviation, QOL = QOL

Table 5: QOL, QOL domains, and coping strategies mean differences between groups 12-week follow-up (N=124)

Dependent variables	Intervention group <i>mean ± sd</i>	Control group <i>mean ± sd</i>	<i>t</i> -value	<i>p</i> -value
QOL overall follow-up	64.40 ± 5.38	56.53 ± 7.17	6.89	< 0.001*
Physical follow-up	65.94 ± 6.37	61.34 ± 15.14	2.20	0.030
Psychological follow-up	68.69 ± 7.66	55.98 ± 11.92	4.02	< 0.001*
Social follow-up	65.98 ± 13.13	58.23 ± 16.58	2.88	0.005*
Environmental follow-up	61.31 ± 8.24	50.68 ± 10.99	6.09	< 0.001*
Problem-focused coping				
12-week follow-up	14.24 ± 2.25	10.85 ± 1.95	8.95	< 0.001*
Emotion-focused coping				
12-week follow-up	51.53 ± 3.87	41.52 ± 4.66	12.97	< 0.001*

Note: p values $< .05$, t = independent sample test, m = mean, sd = Standard Deviation, QOL = QOL

Table 6: Group, time, and interaction of the group and time affect on the overall QOL, QOL domains, and coping strategies

Source	<i>F</i>	<i>p</i> -value
QOL overall		
Group	22.26	$< 0.001^*$
Time	134.82	$< 0.001^*$
Time \times group	123.78	$< 0.001^*$
Physical		
Group	4.46	0.037*
Time	7.87	0.006*
Time \times group	22.41	$< 0.001^*$
Psychological		
Group	12.56	0.001*
Time	73.12	$< 0.001^*$
Time \times group	60.22	$< 0.001^*$
Social		
Group	4.80	0.030*
Time	24.17	$< 0.001^*$
Time \times group	15.55	< 0.001
Environmental		
Group	5.66	0.019*
Time	168.28	$< 0.001^*$
Time \times group	127.21	$< 0.001^*$
Problem-Focused		
Group	53.20	$< 0.001^*$
Time	321.41	$< 0.001^*$
Time \times group	252.74	$< 0.001^*$
Emotion-Focused		
Group	166.75	$< 0.001^*$
Time	314.39	$< 0.001^*$
Time \times group	275.96	$< 0.001^*$

Note: p values $< .05$, F = F-ratio

Table 7: QOL, QOL domains, and coping strategies pairwise comparison between the intervention and control groups

Dependent variables	Group (I)	Group (J)	Mean differences (I-J)	<i>p</i> -value ^a
QOL overall	Intervention	Control	5.19	<0001*
Physical	Intervention	Control	3.63	0.037*
Psychological	Intervention	Control	6.81	0.001*
Social	Intervention	Control	5.95	0.030*
Environmental	Intervention	Control	4.38	0.019*
Problem-Focused coping	Intervention	Control	2.32	< 0.001*
Emotion-Focused Coping	Intervention	Control	7.83	< 0.001*

Note: *p* value was adjusted using the Bonferroni method, *p* values <0.05.

Table 8: QOL, QOL domains, and coping strategies pairwise comparison over time (baseline, post-intervention, and 12-week follow-up)

Dependent variables	Time (I)	Time (J)	Mean Difference (I-J)	<i>p</i> -value ^a
QOL overall	Baseline	Post-intervention	-6.08	< 0.001*
		12-week follow-up	-4.99	< 0.001*
	Post-intervention	12-week follow-up	1.08	0.020*
Physical	Baseline	Post-intervention	-6.20	< 0.001*
		12-week follow-up	-2.35	0.017*
	Post-intervention	12-week follow-up	3.85	0.006*
Psychological	Baseline	Post-intervention	-6.60	< 0.001*
		12-week follow-up	-4.71	< 0.001*
	Post-intervention	12-week follow-up	1.89	0.002*

Social	Baseline	Post-intervention	-6.90	< 0.001*
		12-week follow-up	-4.91	< 0.001*
	Post-intervention	12-week follow-up	1.99	0.002*
Environmental	Baseline	Post-intervention	-4.62	< 0.001*
		12-week follow-up	-8.00	< 0.001*
	Post-intervention	12-week follow-up	3.38	< 0.001*
Problem-focused coping	Baseline	Post-intervention	-3.03	< 0.001*
		12-week follow-up	-2.17	< 0.001*
	Post-intervention	12-week follow-up	.859	< 0.001*
Emotion-focused coping	Baseline	Post-intervention	-7.91	< 0.001*
		12-week follow-up	-5.31	< 0.001*
	Post-intervention	12-week follow-up	2.59	< 0.001*

Note: *p* value was adjusted using the Bonferroni method, *p* values <0 .05, QOL=QOL.

3. Discussion

PC characteristics can influence the QOL and coping strategies. At baseline, a higher proportion of the participants were female PCs compared to males (71% vs. 29%). This ratio is similar to the findings in previous studies conducted in different countries. For example, a study conducted in Iran found that 64.0% of PCs for BC patients were women (Bahrami & Farzi, 2014). A study examining the effectiveness of educational intervention in Singapore documented that 67.5% of the recruited PCs were women (Leow, Chan, & Fai Chan, 2015).

The proportion of female PCs seems to be similar to studies undertaken in countries outside of Asia as well. For example, research conducted in Germany and the USA showed that female PCs accounted for 69.9% and 55.4% of the participants, respectively (Fegg et al., 2013; Titler et al., 2017). A similar study investigating the

effectiveness of education programmes on QOL among BC's PCs reflected that women represented 57.3% of the participants (Badger, Segrin, Hepworth, et al., 2013). The fact that BC patients are women may explain the reason why females account for the majority of PCs in most studies.

Descriptive analyses also indicated that most PCs for women with BC were family members (98.3%). This finding is consistent with previous studies from Asia where the proportion of PCs for BC patients comprised family members and relatives (Leow et al., 2015; Dockham et al., 2016). For instance, Bahrami & Farzi (2014) conducted an RCT among Iranian 64 PCs and 100% of the caregivers were family members. Another study conducted in Singapore among 80 individuals revealed that family PCs accounted for more than 97% of the caregivers (Leow et al., 2015). These findings are consistent with the report from European countries in which more than two-thirds of PCs for women with BC were either close or immediate family members (Badger, Segrin, Pasvogel, & Lopez, 2013; Dockham et al., 2016). In addition, Fegg et al. (2013) found that 91.0% of PCs for German BC patients recruited in their RCT to investigate the effectiveness of existential behavioral therapy (EBT) were family members. These results demonstrate the vital roles played by family members as PCs for BC patients. Furthermore, the result suggests that PCs were unpaid full-time, which may have a direct effect on their paid work, time, QOL, and coping strategies.

The mean age of the PC for women with BC in this study was 41.26 years (SD = 12.10), which is similar to the reports in research undertaken in Iran and Singapore, corresponding to 37.96 years (SD = 10.75) (Bahrami & Farzi, 2014) and 47.16 years (SD = 11.76) (Leow et al., 2015), respectively. In contrast, studies conducted in countries other than Asian countries reported a higher mean age of PCs such as 56.7 and 53.4 years in the USA (Northouse et al., 2013; Dockham et al., 2016). These findings depict that the demographic characteristics of PCs in the present study are similar to those found in Asian studies, but slightly lower relative to research in countries outside of Asia. The disparities in age distribution in Asian and countries outside of Asia may contribute to these contradicting results as the former has a younger population.

The baseline QOL score of the participants in the present study aligns with Asian studies that employed the same tool (Bahrami & Farzi, 2014; Leow et al., 2015). The overall score for baseline QOL was 52.03 and 51.29 for the intervention and control groups, respectively: physical domain (64.06 vs. 63.39), psychological domain (55.68 vs. 54.29), social domain (59.06 vs. 57.29), and environmental domain (53.62 vs. 52.53) (Bahrami & Farzi, 2014). However, the present QOL and those reported in Asian studies are lower compared to the QOL documented among PCs in countries outside of Asia. Specifically, a study conducted in Germany highlighted that the baseline QOL score for the intervention and control groups was 62.2 and 63.2 respectively (Fegg et al., 2013).

The possible reason for the difference in the QOL scores is the higher duration of caring for BC patients in the present study than in other studies, thereby affecting the QOL scores. Another explanation for the QOL baseline differences could be linked to the COVID-19 pandemic, which has led to an increase in the challenges and demands of caring. A recent study conducted in Saudi Arabia using the WHOQOL-BREF tool to examine the effect of COVID-19 on QOL reported that COVID-19 had significantly influenced the overall QOL and the physical, psychological, social, and environmental domains (Algahtani, Hassan, Alsaif, & Zrieq, 2021). These events also apply to Jordan as the pandemic overwhelmed the health system and affected the care for patients, including those requiring home and nursing care such as BC patients (Massad et al., 2020). The PCs' QOL can thus be affected during the pandemic as the patients deteriorate due to shortfalls in healthcare service delivery. Social life was also affected during the pandemic in Jordan as the health sector implemented preventive measures and policies, such as curfew to curb the spread of COVID-19. As a result, environmental, physical, and social domains of QOL were affected (Massad et al., 2020), which could also contribute to the overall low QOL scores among PCs for women with BC in this study.

In this study, coping strategies were divided into two approaches (problem-focused and emotion-focused). The baseline mean score for problem-focused coping for the intervention and control groups was 10.05 and 10.69, whereas the baseline mean score for emotion-focused coping was 41.24 and 41.19. These baseline scores were not significantly different prior to the educational intervention. Similar results were found in a few studies on various intervention programmes on Coping strategies and strategies among caregivers for BC patients (Bahrami & Farzi, 2014; Khanjari, Mianji, Shooshtari, & Haghani, 2020) and the patients themselves (Younis et al., 2021).

For instance, baseline problem and emotion coping scores did not differ significantly before the intervention in a study evaluating the effectiveness of the psycho-education programme on coping strategies among Jordanian women with BC (Younis et al., 2021). Likewise, Khanjari et al., (2020) assessed the impact of Coping strategies training on the QOL among BC patients' daughters and found no difference in their physical, cognitive and school function during enrollment. These studies and the present research denote that the effectiveness of interventional programmes on coping strategies and skills could be succinctly evaluated since the baseline scores were not different between the intervention groups.

Moreover, previous works suggest that educational interventions have a significant effect on the PCs' coping strategies by reducing avoidant strategies and improving active coping strategies (Northouse et al., 2013). Leow et al., (2015) also pointed out that educational intervention programs have a significant impact on coping strategies and positive adaptation, which lead to improved PC QOL. The next section discusses the effectiveness of educational programs on the tested outcomes.

The overall QOL and QOL domains among the PC of women with BC in Jordan were tested over three timeframes (baseline, post-intervention, and 12-week follow-up) to answer the first question: "What is the effect of the educational program on the overall QOL among PC of women with BC in Jordan?" This research question was answered by computing the differences between the intervention and control groups at baseline to the 12-week follow-up.

The intervention group reported a higher QOL score as compared to the control group. The outcome of this trial highlights significant time, group, and time X group effects on the overall QOL and QOL domains, wherever there were changes in both domains over the three timeframes (baseline, post-intervention, and 12-week follow-up). Moreover, the effectiveness of the educational program was measured at two separate time points: 1) the difference between baseline and post-intervention, i.e., second measurement; 2) the difference between post-intervention and 12-week follow-up, i.e., third measurement. A significant difference was found between the intervention and control groups for the QOL score at the second and third measurements.

In addition, significant mean differences were observed between both groups ($p < 0.001$), time ($p < 0.001$), and interaction between group X time ($p < 0.001$). These results answer the research question by highlighting the positive effect of the educational programme on the PCs' QOL. The outcome corroborates the findings from prior studies reporting the effectiveness of educational programmes on QOL among caregivers for women with BC, (Badger, Segrin, Hepworth, et al., 2013; Leow et al., 2015; Khanjari et al., 2020) as well as the patient themselves (Younis et al., 2021).

A study conducted by Badger et al. (2013) in the US also reported higher QOL scores among PCs overtime upon implementing an educational programme and counselling activities, comprising mood and affect management, emotional expression, interpersonal communication and relationships, social support, and follow-up, resources and referral. Meanwhile, apart from the aforementioned components, the educational programme used in the present study entailed telephone and videophone to present the educational module, covering more aspects regarding QOL and coping strategies. The current study also utilised different teaching methods in addition to the distance learning method, while group discussions and interactive sessions were held to deliver more information and techniques to participants. Thus, it is not surprising that the educational programme assisted in improving PCs' QOL scores. The effectiveness of the educational programme in this study is consistent with that of Bahrami and Farzi (2014) in Iran. The latter researchers used the COPE module to support BCs' PCs, which led to a significant increment in participants' QOL in the first nine days of their new role as a PC (Bahrami & Farzi, 2014). Nevertheless, the present study revealed that such high QOL scores could be attained in the long-term as seen in the second and third measurements. Long-term improvement in QOL is important for PCs to cope effectively with their caregiving roles since BC is a chronic disease that could be challenging for PCs (Matthys et al., 2021).

As mentioned previously, QOL is a multidimensional concept. Therefore, this study includes QOL domains to test the effectiveness of the educational programme. Consequently, in the physical domain, significant differences were found between the intervention and control groups following the second and third measurements. In addition, there were significant differences in the mean between the intervention and control groups ($P = 0.037$), time ($p < 0.006$), and interaction between group X time ($p < 0.001$). The significant effects of the educational programme on the physical domain declined during the follow-up time but were still significant. Nevertheless, they are consistent with previous studies (Bahrami & Farzi, 2014; Dockham et al., 2016; Titler et al., 2017). The physical domain may be affected by the current COVID-19 situation in response to the newly implemented restrictions and the curfew. Therefore, the effect of this intervention declined at the follow-up measurement, which consequently suggests expanding the time of the intervention to assess the reliable effectiveness and attain the most benefits from the educational programme. Also, cancer symptom management booklets were distributed and discussed with the participants, which led to an increase in their ability to care for women with BC.

For the psychological domain, statistically significant differences were detected between the intervention and control groups at the second and third measurement points ($P < 0.001$). Likewise, significant differences were observed between the mean of the intervention and control groups ($P = 0.001$), time ($p < 0.001$), and the interaction between group X time ($p < 0.001$). The significant effects of the educational programme on the psychological domain declined at follow-up but were still significant. The positive impact of the educational programme employed in this study on the psychological QOL domain is similar to the results from prior studies (Northouse et al., 2013; Dockham et al., 2016; Titler et al., 2017). Northouse et al. (2013) reported the efficacy of the FOCUS module on emotional QOL among caregivers of cancer patients, whereas Titler et al. (2017) and Dockham et al. (2016) used the same module among PCs for BC patients and found similar outcomes in terms of QOL. The educational programme in this study covered the emotional aspects of QOL, which were merged with positive emotion-focused coping to achieve the most benefits for PC of women with BC. These provisions in the intervention may have assisted in enhancing the PCs' psychological status, thus reflecting in the corresponding QOL domain.

Given the aforementioned positive effects of the educational programme on diverse QOL domains, it is not surprising that the social domain in the intervention group increased significantly in the second and third follow-up compared to the control group. This result contradicts the finding by Bahrami & Farzi (2014) among PCs for BC women in Iran, whereby the use of an educational programme based on the COPE module had no significant effect on the social domain QOL scores. The absence of a social domain in the QOL session of the intervention employed by Bahrami & Farzi (2014) may explain this disparity. In contrast, the educational programme in the present study encompasses an interactive discussion and real-life scenarios, which targeted the social life of PCs. This finding is also supported in studies that used a different intervention, the FOCUS module, which incorporates resources and

information on social support for BC women (Dockham et al., 2016; Titler et al., 2017; Matthys et al., 2021).

The environmental domain is the last domain of QOL, which depends on the previous domain and the perception of PCs. Significant differences were observed in the mean of the intervention and control groups for the environmental domain at the second and third measurement points, as well as for the interaction between group and time. The environmental domain improved at the follow-up measurement point, which might be due to the timely need to change and cope with the surroundings. The environmental domain was equally found to improve significantly among PCs and their BCs in response to educational interventions (Khanjari et al., 2020; Younis et al., 2021). The contents of the intervention, which is centred on diverse environmental resources such as physical safety and security, health and social care, home environment, accessibility and quality, and opportunities to gather more skills and new information. These elements are pertinent in the context of the environmental domain and need to be considered when designing an educational intervention (Younis et al., 2021). Thus, the present study supports this position given that most of the itemised elements were taken into account in developing the educational programme.

The improvement in the overall QOL and domains may be linked to the level of awareness and support provided to PCs in the intervention as emphasised in prior studies (Khanjari et al., 2020; Younis et al., 2021). Since only PCs of women with BC were included and subjected to the educational programme, they were exposed and enlightened about their role and how it may influence their QOL. Moreover, the nursing staff assisted in reaching the participants and explained the research procedures, which made them understand and free to express their feelings in the absence of the patients during the interactive discussion.

The COVID-19 pandemic may also have contributed to the significant effect on QOL in different ways. Since this study was conducted in the middle of the COVID-19 crisis, the negative impacts led to a drastic decline in QOL among the general population, including PCs for different types of cancer (Bergmann & Wagner, 2021; Kurzhals et al., 2021; Masterson-Algar, Allen, Hyde, Keating, & Windle, 2022). Hence, the demand for counselling and interventions to manage poor QOL status among affected individuals may have increased. These events could be gleaned from the PCs' readiness to learn and address the prevailing issues in the caregiving functions. Their learning abilities could have also been enhanced through the various teaching strategies and delivering the materials using different methods. Moreover, PCs were randomly recruited from the selected hospitals, which led to the enrolment of participants from all socio-economic statuses with equal chances of being affected by the pandemic. Lastly, another crucial contribution is the comprehensiveness of the educational programme in terms of QOL and coping strategies, which covered the theoretical and practical aspects and their role in developing suitable educational interventions. In addition, the videos shared with PCs after the baseline assessment and before post-intervention enabled them to lead some parts of the discussion and

create better discussions and life scenarios during their sessions. This led to a high response rate and, in turn, higher significance than in previous studies.

Previous studies by Northouse et al. (2013), Dockham et al. (2016), and Titler et al. (2017) used the same module, which was built based on the FOCUS module (family involvement, optimistic attitude, coping effectiveness, uncertainty, and symptom management). The present educational module covers all aspects of PCs and addresses all domains that affect caregiving (physical, psychological, social, and environmental), whereas the FOCUS module lacks the QOL domains. Meanwhile, despite the differences in the theoretical education content, the present results aligned with previous studies (Etemadifar et al., 2014; Leow et al., 2015; Khanjari et al., 2020) where educational programmes had a significant impact on overall QOL and the QOL domains.

This study also investigated the effectiveness of the educational programs on coping strategies among PCs for BC women in Jordan. Prior studies already highlighted the importance of coping strategies in enhancing QOL (Teixeira et al., 2018; Younis et al., 2021). While considering an issue in the surrounding cultural context, PCs' ways of coping play a significant role in determining the impact of stressors on their QOL (Teixeira et al., 2018).

The intervention group reported a higher problem-focused coping score compared to the control group. Furthermore, the results were significant based on the time, group, and interaction between both variables on problem-focused coping scores over the three measurement points. Specifically, problem-focused coping scores at the second and third measurements were significantly higher in the intervention group compared to the control group. This result answers the research question presented earlier in the first chapter of this thesis regarding the positive effect of the educational programme on problem-focused coping strategies among PCs. These findings corroborate those of previous studies in which educational programs had a significant and positive effect on the coping techniques and skills of PCs (Aydogan et al., 2016; Khanjari et al., 2020; Younis et al., 2021).

Khanjari et al. (2020) found significant improvement in the physical, cognitive and school functions among BC patients' daughters in Iran following the implementation of coping skills. Likewise, the adaptive coping scores of BC patients in Jordan increased significantly in 6 weeks after a psycho-education program (Younis et al., 2021). Aydogan et al. (2016) conducted face-to-face interviews using the COPE scale comprising 60 items, and found that problem-focused coping was statistically higher in the intervention group compared to the control group. The similar findings in the aforementioned research and the current study may be attributed to the comprehensive module employed, irrespective of the slightly different delivery methods. For instance, Aydogan et al. (2016) used the COPE scale and physical interaction with the PCs, whereas various teaching methods including online discussions and booklets were used, which facilitated mutual scenarios and

interactive discussion between participants. Notwithstanding, both interventions were effective in improving participants' coping strategies. The present study however entailed a longer follow-up period of 12 weeks compared to one month and three weeks considered in other studies (Aydogan et al., 2016; Khanjari et al., 2020). As a result, our educational programme offers the advantage of eliciting long-term improvement in PCs' coping strategies, which is critical in caring for BC patients. Northouse et al. (2013) and Leow et al. (2015) demonstrated a reduction in avoidant strategies and improved active coping strategies following educational intervention. The latter study is among the few intervention research on coping strategies among PC for BC women in Asian countries. Thus, apart from contributing to the literature from Asian nations, the present data offer opportunities to expand the results reported herein.

Based on the results of this study, the educational programme had a significant effect on the problem-focused coping strategy, which is vital to resolve and adapt to stressors such as BC diagnosis, daily caring tasks, financial challenges, and personal needs (Matthys et al., 2021). However, an emotion-focused strategy is also important for dealing with and expressing the feelings arising from these stressors. When compared to the control group, the intervention group had a higher emotion-focused coping score and significant interactions were observed for the time, group, and time X group over the three timeframes (baseline, post-intervention, and 12-week follow-up). Thus, the final research question in this study was answered since the educational programme had a positive effect on emotion-focused coping among PCs.

There is limited information on the effects of educational programmes on emotion-focused coping strategies among PCs for BC patients. Thus, the current finding is among the novelties in this research. Overall, the educational programme enhanced emotion-focused coping scores of the participants over time, which reflects a higher likelihood for the PCs to address emotional issues arising while caring for BC patients. This result is consistent with the reports by Winger et al., (2018) that demonstrated a significant increase in emotion-focused coping in lung cancer PCs after four sessions of coping strategies and telephone symptom management (TSM).

Since the latter researchers recorded positive impacts upon using two main teaching methods, it is not surprising that the present study yielded significant results since numerous teaching techniques were employed. For instance, telephone support was used with comprehensive educational material, life scenarios, and group discussion, facilitating effective monitoring and recording of improvement in PCs' coping strategies during the intervention.

4. Conclusion and Recommendations

This study demonstrates the significant impact that well-designed educational interventions can have on the well-being of caregivers. The findings support the broader implementation of such interventions, with consideration given to including

palliative patients and extending the intervention's duration to maximize its benefits. Policymakers and stakeholders are encouraged to integrate these insights into healthcare strategies to ensure that caregivers receive the necessary support to enhance their coping abilities and quality of life. This approach has the potential to significantly improve the overall care experience for both patients and their families, paving the way for more compassionate and effective healthcare systems.

It is crucial for policymakers and stakeholders to consider integrating similar interventions into national healthcare frameworks. Increasing the sample size to cover a broader demographic, including palliative care patients, would offer a more comprehensive understanding of the intervention's impact across different stages of illness. Moreover, prolonging the duration of the intervention could provide deeper insights into the long-term benefits and sustainability of improved coping strategies and QOL. Engaging a wider range of stakeholders, such as healthcare providers, patient advocacy groups, and community organizations, is essential to ensure that the intervention is tailored to meet the diverse needs of caregivers and patients. By adopting a more inclusive and long-term approach, there is potential to significantly enhance the influence on healthcare policies and practices, ultimately leading to better support for those affected by BC.

References

- Algahtani, F. D., Hassan, S. U. N., Alsaif, B., & Zrieq, R. (2021). Assessment of the quality of life during covid-19 pandemic: A cross-sectional survey from the kingdom of saudi arabia. *International Journal of Environmental Research and Public Health*, 18(3). <https://doi.org/10.3390/ijerph18030847>
- Arruebo, M., Vilaboa, N., Sáez-Gutierrez, B., Lambea, J., Tres, A., Valladares, M., & González-Fernández, Á. (2011). Assessment of the Evolution of Cancer Treatment Therapies. *Cancers*, 3(3), 3279. <https://doi.org/10.3390/CANCERS3033279>
- Aydogan, U., Doganer, Y. C., Komurcu, S., Ozturk, B., Ozet, A., & Saglam, K. (2016). Coping Attitudes of Cancer Patients and Their Caregivers and Quality of Life of Caregivers. *Indian Journal of Palliative Care*, 22(2), 150–156. <https://doi.org/10.4103/0973-1075.179598>
- Azamjah, N., Soltan-Zadeh, Y., & Zayeri, F. (2019). Global Trend of Breast Cancer Mortality Rate: A 25-Year Study. *Asian Pacific Journal of Cancer Prevention : APJCP*, 20(7), 2015. <https://doi.org/10.31557/APJCP.2019.20.7.2015>
- Badger, Segrin, C., Hepworth, J. T., Pasvogel, A., Weihs, K., & Lopez, A. M. (2013). Telephone-delivered health education and interpersonal counseling improve quality of life for Latinas with breast cancer and their supportive partners. *Psycho-Oncology*, 22(5), 1035–1042. <https://doi.org/10.1002/pon.3101>
- Badger, Segrin, C., Pasvogel, A., & Lopez, A. M. (2013). The effect of psychosocial interventions delivered by telephone and videophone on quality of life in early-stage breast cancer survivors and their supportive partners. *Journal of Telemedicine and Telecare*, 19(5), 260–265. <https://doi.org/10.1177/1357633X13492289>
- Bahrani, M., & Farzi, S. (2014). The effect of a supportive educational program based on COPE model on caring burden and quality of life in family caregivers of women with breast cancer. *Iranian Journal of Nursing and Midwifery Research*, 19(2), 119–126. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/24834079>
- Bergmann, M., & Wagner, M. (2021). The Impact of COVID-19 on Informal Caregiving and Care Receiving Across Europe During the First Phase of the Pandemic. *Frontiers in*

- Public Health*, 9, 673874. <https://doi.org/10.3389/FPUBH.2021.673874/BIBTEX>
- Carver, C. S. (1997). No Title. *International Journal of Behavioral Medicine*, 4(1), 92–100. https://doi.org/10.1207/s15327558ijbm0401_6
- Dockham, B., Schafenacker, A., Yoon, H., Ronis, D. L., Kershaw, T., Titler, M., & Northouse, L. (2016). Implementation of a psychoeducational program for cancer survivors and family caregivers at a cancer support community affiliate: A pilot effectiveness study. *Cancer Nursing*, 39(3), 169–180. <https://doi.org/10.1097/NCC.0000000000000311>
- Etemadifar, S., Bahrami, M., Shahriari, M., & Farsani, A. K. (2014). The effectiveness of a supportive educative group intervention on family caregiver burden of patients with heart failure. *Iranian Journal of Nursing and Midwifery Research*, 19(3), 217–223. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/24949057>
- Farahani, A., Maarefvand, M., Biglarian, A., & Khubchandani, J. (2016). Effectiveness of a Brief Psychosocial Intervention on Quality of Life of Primary Caregivers of Iranian Children With Cancer: A Randomized Controlled Trial. *Journal of Pediatric Nursing*, 31(4). <https://doi.org/10.1016/j.pedn.2016.01.002>
- Fegg, M. J., Brandstätter, M., Kögler, M., Hauke, G., Rechenberg-Winter, P., Fensterer, V., ... Borasio, G. D. (2013). *Existential behavioural therapy for informal caregivers of palliative patients: a randomised controlled trial*. <https://doi.org/10.1002/pon.3260>
- Hair, J., Hollingsworth, C. L., Randolph, A. B., & Chong, A. Y. L. (2017). An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management and Data Systems*, 117(3). <https://doi.org/10.1108/IMDS-04-2016-0130/FULL/XML>
- Iddrisu, M., Aziato, L., & Ohene, L. A. (2021). Socioeconomic impact of breast cancer on young women in Ghana: A qualitative study. *Nursing Open*, 8(1). <https://doi.org/10.1002/NOP2.590>
- Jordan Cancer Registry, & Registry, J. C. (2018). Cancer Incidence in Jordan. *Ministry of Health, Jordan*, 11, 11,15-17. Retrieved from https://moh.gov.jo/ebv4.0/root_storage/ar/eb_list_page/ÇáÊÑíÑ_ÇáÓäæí_áÇÖÇÈÇÊ_ÇáÓÑØÇä_ÇãÖÍáÉ_Ýí_ÇáÇÑä_áÚÇã_2018.pdf
- Khanjari, S., Mianji, M., Shooshtari, M. H., & Haghani, H. (2020). *Impact of Coping Skills Training on the Quality of Life Among the Daughters of Mothers with Breast Cancer*. 8(4). <https://doi.org/10.30476/IJCBNM.2020.83048.1132>
- Kim, Spillers, & Hall, &. (2012). Quality of life of family caregivers 5 years after a relative's cancer diagnosis: follow-up of the national quality of life survey for caregivers. *Psycho-Oncology*, 21(3), 273–281. <https://doi.org/10.1002/pon.1888>
- Kurowska, A., Kózka, M., & Majda, A. (2021). ‘How to cope with stress?’ Determinants of coping strategies used by parents raising children with intellectual disabilities, other developmental disorders and typically developing children. A cross-sectional study from Poland. *Journal of Mental Health Research in Intellectual Disabilities*, 14(1), 23–49. <https://doi.org/10.1080/19315864.2020.1832166>
- Kurzahls, J. K., Klee, G., Busch, H., Hagelstein, V., Zillikens, D., Terheyden, P., & Langan, E. A. (2021). The impact of the Covid-19 pandemic on quality of life in skin cancer patients. *PLoS ONE*, 16(8). <https://doi.org/10.1371/JOURNAL.PONE.0255501>
- Lemeshow, S., Hosmer, D. W., Klar, J., & Lwanga, S. K. Adequacy of sample size in health studies. , John Wiley & Sons Ltd., Chichester, 1-5. § (1990).
- Leow, M., Chan, S., & Fai Chan, M. (2015). A Pilot Randomized, Controlled Trial of the Effectiveness of a Psychoeducational Intervention on Family Caregivers of Patients

- With Advanced Cancer. In *Oncology nursing forum* (Vol. 42).
<https://doi.org/10.1188/15.ONF.E63-E72>
- Lim, H. A., Tan, J. Y., Chua, J., Yoong, R. K., Eng Lim, S., BCh Bao, M., ... Mahendran, R. (2017). Quality of life of family caregivers of cancer patients in Singapore and globally. *Singapore Med J*, 58(5), 258–261. <https://doi.org/10.11622/smedj.2016083>
- Lim, K., Lee, Lim, Kim, & Lee. (2013). *No Title*. 45(3).
<https://doi.org/10.4143/crt.2013.45.3.226>
- Liu, Q., Ye, F., Jiang, X., Zhong, C., & Zou, J. (2023). Effects of psychosocial interventions for caregivers of breast cancer patients: A systematic review and meta-analysis. *Heliyon*, 9(2), e13715. <https://doi.org/10.1016/J.HELIYON.2023.E13715>
- Macdonald, O. F. *Scholar Commons Putting the Puzzle Together: Factors Related to Emotional Well-being in Parents of Children with Autism Spectrum Disorders Scholar Commons Citation.* , (2011).
- Mahendran, R., Lim, H. A., Tan, J., Ng, H. Y., Chua, J., Lim, S. E., ... Griva, K. (2017). Evaluation of a brief pilot psychoeducational support group intervention for family caregivers of cancer patients: a quasi-experimental mixed-methods study. *Health and Quality of Life Outcomes*, 15(1), 1–8.
- Massad, I., Al-Taher, R., Massad, F., Al-Sabbagh, M. Q., Haddad, M., & Abufaraj, M. (2020). *The impact of the COVID-19 pandemic on mental health: early quarantine-related anxiety and its correlates among Jordanians*. 26(10).
<https://doi.org/10.26719/EMHJ.20.115>
- Masterson-Algar, P., Allen, M. C., Hyde, M., Keating, N., & Windle, G. (2022). Exploring the impact of Covid-19 on the care and quality of life of people with dementia and their carers: A scoping review. *Dementia (London, England)*, 21(2), 648.
<https://doi.org/10.1177/14713012211053971>
- Matthys, O., De Vleminck, A., Dierickx, S., Deliens, L., Van Goethem, V., Lapeire, L., ... Cohen, J. (2021). Effectiveness of a nurse-delivered (FOCUS+) and a web-based (iFOCUS) psychoeducational intervention for people with advanced cancer and their family caregivers (DIAdIC): study protocol for an international randomized controlled trial. *BMC Palliative Care*, 20(1), 1–18. <https://doi.org/10.1186/S12904-021-00895-Z/FIGURES/3>
- Mour?o, C. M. L., Fernandes, A. F. C., Moreira, D. P., Martins, M. C., Mourão, C. M. L., Fernandes, A. F. C., ... Martins, M. C. (2017). *No Title*. 51, e03268.
<https://doi.org/10.1590/S1980-220X2017001803268>
- Nawel, H., Elisabeth, S., & Nawel, H., & Elisabeth, S. (2015). Adaptation and Validation of the Tunisian Version of the Brief COPE Scale. *European Health Psychologist*, 17, 783.
- Northouse, L. L., Mood, D. W., Schafenacker, A., Kalemkerian, G., Zalupski, M., LoRusso, P., ... Kershaw, T. (2013). Randomized clinical trial of a brief and extensive dyadic intervention for advanced cancer patients and their family caregivers. *Psycho-Oncology*, 22(3), 555–563. <https://doi.org/10.1002/pon.3036>
- Noureen, A., Ali, A., Muhammad, S., & Shah, A. (2019). The Moderating Role of Coping Strategies in Occupational Stress and Burnout among Mental Health Practitioners in Pakistan. *Clinical and Counselling Psychology Review*, 1(1).
<https://doi.org/10.32350/CCPR.11.03>
- Pang, X., Jin, Y., & Wang, H. (2022). Effectiveness and moderators of cancer patient-caregiver dyad interventions in improving psychological distress: A systematic review and meta-analysis. *Asia-Pacific Journal of Oncology Nursing*, 9(8).
<https://doi.org/10.1016/J.APJON.2022.100104>

- Perez-Ordóñez, F., Frías-Osuna, A., Romero-Rodríguez, Y., & del-Pino-Casado, R. (2016). Coping strategies and anxiety in caregivers of palliative cancer patients. *European Journal of Cancer Care*, 25(4), 600–607. <https://doi.org/10.1111/ecc.12507>
- Reblin, M., Tay, D. L., Iacob, E., Cloyes, K. G., Hebdon, M. C. T. T., & Ellington, L. (2023). No Title. *International Journal of Environmental Research and Public Health*, 20(6). <https://doi.org/10.3390/IJERPH20065009>
- Romito, F., Goldzweig, G., Cormio, C., Hagedoorn, M., & Andersen, B. L. (2013). Informal Caregiving for Cancer Patients. *Cancer*, 119(0 11), 2160–2169. <https://doi.org/10.1002/CNCR.28057>
- Siegel, R. L., Miller, K. D., & Jemal, A. (2017). Cancer statistics. 2017. *CA: A Cancer Journal for Clinicians*, 67(1), 7–30. <https://doi.org/10.3322/caac.21387>
- Teixeira, R. J., Applebaum, A. J., Bhatia, S., Brand?o, T., & Brandão, T. (2018). The impact of coping strategies of cancer caregivers on psychophysiological outcomes: an integrative review. *Psychology Research and Behavior Management*, 11, 207.
- Titler, M. G., Visovatti, M. A., Shuman, C., Ellis, K. R., Banerjee, T., Dockham, B., ... Northouse, L. (2017). Effectiveness of implementing a dyadic psychoeducational intervention for cancer patients and family caregivers. *Supportive Care in Cancer*, 25(11), 3395–3406. <https://doi.org/10.1007/s00520-017-3758-9>
- Winger, J. G., Rand, K. L., Hanna, N., Jalal, S. I., Einhorn, L. H., Birdas, T. J., ... Mosher, C. E. (2018). Coping Skills Practice and Symptom Change: A Secondary Analysis of a Pilot Telephone Symptom Management Intervention for Lung Cancer Patients and Their Family Caregivers. *Journal of Pain and Symptom Management*, 55(5). <https://doi.org/10.1016/j.jpainsymman.2018.01.005>
- Younis, M., Norsa'adah, B., & Othman, A. (2021). Effectiveness of psycho-education intervention programme on coping strategies among Jordanian women diagnosed with breast cancer: a randomised controlled trial. *Breast Cancer: Targets and Therapy*, 285–297.