

## RESEARCH ARTICLE

# Coping and Quality of Life in Turkish Women Living with Ovarian Cancer

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### Abstract

**Background:** This study investigated the utilization of both problem and emotion focused coping strategies and their association with aspects of quality of life among Turkish women with ovarian cancer undergoing chemotherapy. **Materials and Methods:** The convenience sample consisted of 228 patients in all disease stages. The data were collected using the brief COPE, QOL-Cancer patient tool, sociodemographic sheet, and medical variables were gathered from patients' medical charts. **Results:** Findings reveal that quality of life is moderately high for this group of cancer patients, despite some specific negative facets of the illness and treatment experience. Acceptance, emotional support and religion were the most frequently used problem-focused coping strategies and self-distraction, venting and behavioral disengagement were the most frequently used emotion-focused coping strategies reported by patients. Overall quality of life and, particularly, psychological and spiritual well-being scores of younger patients were lower. Patients reported using significantly more problem-focused coping than emotion-focused coping, and more problem-focused and less emotion-focused coping predicted greater quality of life. Problem-focused coping was related to patients' physical and spiritual well-being and emotion-focused coping was related inversely with psychological and social well-being. **Conclusions:** Coping strategies are influential in patient quality of life and their psychosocial adaptation to ovarian cancer. Psycho-oncology support programs are needed to help patients to frequent use of problem-focused coping and reduce emotion-focused coping strategies to improve overall quality of life.

**Keywords:** Ovarian cancer - coping - quality of life - psycho-oncology - oncology social work

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### Introduction

Ovarian cancer is the fifth most common type among all female cancers in Turkey. As a result of uncertain symptoms and limited screening tools for ovarian cancer, approximately two thirds of patients present with stage 3 or 4 disease. Standard treatment for ovarian cancer includes radical surgery and chemotherapy which can have a significant impact on quality of life, and because the recurrence rate of ovarian cancer is 75% within the first 2 years, many women will undergo chemotherapy at multiple intervals after their initial diagnosis (De Moor et al., 2006; Unal and Ergor, 2013). Research suggests that chemotherapy is characterized by aversive side effects such as nausea, vomiting, fatigue, and weight loss (Fields et al., 2001; Holland et al., 2010). Due in part to the high risk of mortality, often advanced stage of disease upon diagnosis and prolonged treatment with chemotherapy, it is not surprising to find accompanying stress, avoidant coping, depression, anxiety, and poorer overall quality of life in ovarian cancer (Reid et al., 2011; Clevenger et al., 2013; Price et al., 2013). These experiences can have a substantial impact and persist for prolonged periods of time following initial diagnosis (Lutgendorf et al., 2013).

Therefore, it is necessary to examine coping strategies and multiple dimensions of quality of life in patients with ovarian cancer undergoing treatment as well as identify factors that may reduce the impact of their cancer and treatment on these variables. Identifying coping strategies and needs associated with poor psychosocial health is important to developing and appropriately targeting interventions for ovarian cancer patients (Roland et al., 2013).

One factor that is consistently associated with the aspects of health, and overall quality of life is coping. Coping is claimed to be one of the core concept in the context of quality of life, and is strongly associated with the regulation of emotions throughout the stress period (Folkman and Moskowitz, 2004). But there is as yet no clear consensus with regard to which coping strategies or modes of coping are most effective in resolving difficulties, alleviating emotional distress and mitigating future problems (Tuncay et al., 2008). It is suggested, however, that in the long term, emotion-focused or avoidant coping strategies may be less adaptive than problem-focused or active strategies (Lazarus and Folkman, 1984), although the impact of these strategies is mediated by the specific constraints imposed by the stressful situation.

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How cancer patients adjust to the changes in their lives caused by the stressful experience of a cancer diagnosis depends on their coping responses. Researchers (Antoni et al., 2001) have classified coping strategies according to their outcomes, in terms of their functional or adaptive value. Conversely, effectiveness has been assessed in terms of eliminating distress, preserving social functioning, and maintaining the patient's sense of well-being. Significant relationships between coping strategies and quality of life have been found (Kershaw et al., 2004). In addition, an association has been established between incidences of problems threatening oncology patients' quality of life and the venting strategy of coping (Barinková and Mesarsova, 2012).

Research specifically addressing the role of coping strategies in women with ovarian cancer, consistent with the wider literature of coping, suggests that problem-focused coping strategies such as active coping, acceptance and planning over the cancer are conducive to positive adjustment whereas emotion-focused coping strategies such as behavioral disengagement and denial have been associated with poor psychosocial outcomes. For instance, Steginga and Dunn (1997) surveyed 82 women, focusing on personal coping strategies. These researchers reported that women most often obtained emotional support from family members, and their most common coping strategy was positive reframing. Other research findings indicated that coping by seeking social support was associated with better outcomes with respect to social well-being, physician-patient relationships, distress, functional status, and clinical status (Lutgendorf et al., 2003; Sood et al., 2006; Thaker et al., 2006). Positive reframing, acceptance, and active coping similarly predict better physical and psychological well-being, and less distress. In contrast, coping by using denial or behavioral disengagement has been associated with concurrently higher levels of anxiety, depression, and overall distressed mood as well as poorer quality of life one year post-diagnosis (Lutgendorf et al., 2000a; Lutgendorf et al., 2000b; Tuncay and Isikhan, 2010). However, it is not known how treatment or disease factors influence coping efforts and relationships between coping and quality of life outcomes among ovarian cancer patients.

Effects of using particular coping strategies with cancer on quality of life have been also documented. Recent studies suggest that coping strategies are determinants of the cancer patients' quality of life (Ferrell et al., 2003; Butow et al., 2013; Price et al., 2013). Moreover, they are considered modifiable aspects of the patients' lives that contribute to various health and psychosocial related outcomes. Furthermore, problem-focused coping strategies may reduce some of the negative effects of cancer treatment on quality of life and promote positive psychosocial adaptation.

In reviewing the research literature, a number of studies that specifically examined quality of life in women with ovarian cancer were found (Guidozzi, 1993; Ersek et al., 1997; Fitch et al., 2001; Clevenger et al., 2013), while the rest included women with various types of gynecologic cancer, and authors have noted that despite losses in physical, sexual, and psychological function that may

occur with ovarian cancer, overall evaluation of quality of life is relatively moderate or high (e.g. Guidozzi, 1993; Ersek et al., 1997; Goker et al., 2011; Xia et al., 2011; Clevenger et al., 2013; Price et al., 2013; Srisuttayasathien and Khemapech, 2013).

Goker et al. (2011), investigated quality of life of 119 women diagnosed with different types of gynecologic cancer. They found that women with ovarian cancer had the highest while women with cervical cancer had the lowest quality of life score. In Guidozzi's (1993) prospective descriptive study with patients with advanced ovarian disease, a structured questionnaire was used to collect data every three months over a two-year period. Findings indicated that in the first year, quality of life did not differ between those patients whose cancer persisted despite treatments and those who recovered. However, after one year, quality of life was lower for the former group. In another study (Fitch et al., 2001), 39 young women were surveyed about their experiences of living with ovarian cancer. Questionnaire items were developed from earlier in-depth interviews with this population and addressed topics such as "diagnostic and treatment issues, impact on quality of life, communication and satisfaction with information provided and problems experienced and help received". The researchers reported that women rated their quality of life significantly lower following their experience with ovarian cancer, and about two thirds reported a lifestyle change. In summary, studies conducted with women living with ovarian cancer have demonstrated that their lives are changed, with reportedly negative and positive effects on quality of life.

The studies with ovarian cancer patients that specifically examined quality of life used different conceptualizations and methodologies; hence, the findings are not directly comparable. But more importantly, research conducted in women with ovarian cancer suggests that psychosocial aspects may impact tumor-related markers. For example, Lutgendorf et al. found that aspects of social well-being, emotional support from family and friends and less distance from friends, was associated with lower levels of vascular endothelial growth factor (VEGF), a cytokine that stimulates angiogenesis and acts on the vascular endothelium to enhance vascular permeability. Researchers also found that hopelessness and worthlessness were related to higher levels of VEGF (Lutgendorf et al., 2003; Lutgendorf et al., 2013). The research summarized here supports the importance of exploring whether type of coping strategies (emotion-focused versus problem focused) is effective on quality of life in ovarian cancer patients who are on chemotherapy.

#### *Study aims*

The main aim of this study was to assess the relationship of the coping strategies with quality of life among women living with ovarian cancer. We also aimed to examine which type of coping strategies were related to higher quality of life in patients. It is hypothesized that patients facing a more threatening prognosis would utilize a greater variety of coping strategies both problem-focused and emotion-focused, and would do so with greater

frequency. We also hypothesized that problem-focused coping strategies would be associated with better quality of life, whereas emotion-focused strategies would be associated with poorer quality of life. Sociodemographic and medical characteristics of the patients used as control variables.

## Materials and Methods

### Setting

Purposive sampling was used to select individuals who could answer the data-gathering questions. Women were included if they were older than 18 years of age, receiving intravenous chemotherapy for epithelial ovarian cancer, and starting treatment for the first time or starting a new type of chemotherapy. Women were excluded if they had serious physical comorbidity because this would make it difficult to examine coping strategies and dimensions of quality of life associated with an ovarian cancer diagnosis rather than another health problem. Women with a serious psychiatric comorbidity were also excluded because this type of limitation could compromise their capacity to provide informed consent. In addition, women were excluded if they were illiterate.

From a total of 253 patients were contacted by researcher at their treatment center in a state hospital from 2011 to 2013. 25 patients refused to participate, and the questionnaire was administered to 228 patients. The study received ethical approval at the large urban teaching hospital where it was based. Data collection procedure was conducted in a private interview room by a clinical social worker in the hospital.

Patients answered a compound questionnaire composed of different instruments to evaluate sociodemographic and medical characteristics, quality of life, and coping strategies. The scales of quality of life, and coping strategies were self-administered and an informed consent was obtained from each patient. Questionnaire data were entered in a database and verified by a second investigator. Stage of disease at diagnosis, time since diagnosis, and recurrence status at the time of the survey were extracted from the patients' medical records.

### Sociodemographic and medical characteristics

The sample was heterogeneous with respect to prognostic and clinical factors for ovarian cancer. Patients were two hundred twenty-eight women who ranged in age from 40 to 67 years ( $M=58.68$ ,  $SD=6.80$ ) and most of them were married (81.6%). Almost half of the patients had up to high school education (46.5%), unemployed (47.4%), and had almost equal income to their spending (46.9%). Furthermore, while only 3.9% were in stage 1 and 15.8% were in stage 2, more than half of them (56.6%) were in stage 3 and 23.7% were in stage 4 at diagnosis in cancer. 68.4% of the patients had no recurrence. The average time since diagnosis was 2.36 years with a range from six months to five years.

### Instruments

**QOL-CP:** quality of life was measured by a cancer-specific instrument, the Quality of Life-Cancer Patient

(QOL-CP) questionnaire, which assesses multiple dimensions of quality of life in individuals with cancer (Ferrell et al., 1995). The QOL-CP includes 41 items representing four domains of quality of life: physical well-being (8 items), psychological well-being (18 items), social well-being (8 items), and spiritual well-being (7 items). Participants rate themselves along an interval rating scale ranging from 0 to 10 for each item. For scoring purposes, all items were ordered, so that 0 indicated the lowest or worst possible quality of life outcome, and 10 indicated the highest or best possible quality of life outcome for each item. Each item was recorded in order to vary from 0 to 100, with higher values indicating better quality of life. An overall quality of life score was computed by averaging all 41 items. The validity and reliability of this inventory for Turkish society were studied by Reis (2003). The reliability (Cronbach's alpha coefficient) for this sample was more than 0.75 for all subscales.

**Brief COPE:** coping was assessed using the brief COPE scale. Carver, Scheier, and Weintraub (1993) developed the COPE as a comprehensive questionnaire of 15 theoretically derived coping styles or strategies. An abbreviated version of the COPE has been developed – the brief COPE (Carver, 1997). The scale was administered to assess patients' coping strategies. In health psychology, the COPE and the brief COPE have predicted clinically relevant outcome across many stressful situations and populations (Tuncay et al., 2008; Horney et al., 2011; Dedert et al., 2012; Yoo et al., 2014). The brief COPE Scale is a 28-item self-report measure of problem-focused versus emotion-focused coping skills. The scale consists of 14 domains/sub-scales (self-distraction, active coping, denial, substance use, use of emotional support, use of instrumental support, behavioral disengagement, venting, positive reframing, planning, humor, acceptance, religion, self-blame) of two items each. Patients are asked to respond to each item on a four-point Likert scale, indicating what they generally do and feel when they experience cancer-related stressful events (1= I have not been doing this at all - 4= I have been doing this a lot). The higher the score on each coping strategy, the greater the use of the specific coping strategy. The brief COPE scale has good internal consistency and test-retest reliability, and concurrent validity has been established. The validity and reliability of this inventory for Turkish society were studied by Tuna (2003). The reliability for this sample was more than 0.75 for all subscales.

The researcher also developed a sociodemographic and cancer related questionnaire including age, marital status, educational level, employment status, monthly income, stage of the illness, recurrence, and time since diagnosis of cancer. These variables were implemented as control variables.

### Statistical analysis

Means, standard deviations and possible scale ranges were used to identify both the quality of life scores and the types of coping strategies used most frequently by patients with ovarian cancer. Pearson correlation coefficients were calculated to assess the relationship

between coping strategies and demographic and medical variables. All variables were examined for normality of distribution and outliers. To test the influence of coping and other factors on quality of life, a series of hierarchical multiple regression analyses were conducted for patients on the physical, psychological, social and spiritual well-being scales. Variables were entered in predetermined order based on conceptual importance. First, the set of sociodemographic (age, marital status, education, employment status, monthly income) and medical variables (stage of disease, time since diagnosis, number of recurrences) were entered into the equation. Then overall problem and emotion focused coping scores were entered. To test which type of coping (i.e., problem-focused vs emotion-focused) accounted for more variance in patient quality of life variables, each was entered last into the model. All statistical procedures were performed using SPSS 20.0 for Windows.

## Results

Acceptance, emotional support and religion were the most frequently used three of the problem-focused coping strategies reported by patients. Results also showed that self-distraction, venting and behavioral disengagement were the most frequently used three of the emotion-focused coping strategies. The least used coping strategies were denial, humor, and substance use. Results indicated that patients reported using significantly more problem-focused coping ( $5.88 \pm 0.81$ ) than emotion-focused coping ( $3.40 \pm 0.67$ ).

Overall quality of life score was determined to be

moderately high,  $253.25 (\pm 22.43)$ . The physical well-being score was  $51.45 (\pm 9.95)$ , psychological well-being score was  $94.11 (\pm 23.57)$ , Social well-being score was  $55.10 (\pm 13.64)$  and spiritual well-being score was found to be  $52.59 (\pm 12.26)$ . Psychological well-being was found lowest, whereas spiritual well-being was found highest.

The correlations between the coping strategies and sociodemographic, and medical variables for patients were depicted in Table 1. Patients who used both more problem and emotion focused coping were younger, single, more educated, employed, had earlier stage of cancer, and had higher monthly income. The correlation coefficients also indicated that patients who used more emotion-focused coping were newly diagnosed and had lower recurrence of cancer. Problem-focused coping were significantly positively correlated with time since diagnosis.

The correlations between quality of life variables and sociodemographic, and medical variables for patients were given in Table 2. Patients who had higher overall quality of life scores were older, married, less educated, unemployed, not newly diagnosed, had lower monthly income and surprisingly had a higher stage of cancer. The Pearson correlation coefficients revealed that physical well-being was statistically significantly associated with age, marital status, level of education, employment status, monthly income and stage of the cancer, indicates that, older, married, more educated, unemployed, and higher staged cancer patients had a lower level of physical well-being.

Both psychological and spiritual well-being was significantly correlated with all of the independent variables (except recurrence in spiritual well-being). Patients who had a lower psychological and spiritual well-being were younger, single, more educated, employed, had lower monthly income, newly diagnosed, and in the earlier stages of cancer. Surprisingly, patients who had less recurrence also had a lower psychological well-being.

Multiple regression analyses were conducted to examine the influence of coping strategies, sociodemographic and medical factors on patients' quality of life. The full model of sociodemographic, medical variables and coping strategies to predict all domains of quality of life were statistically significant. The overall multivariate model accounted for 73.8% of the variance of patients' physical well-being,  $F(10.217)=61.224$ ; 75% of the variance of patients' psychological well-being,  $F(10.217)=65.196$ ; 66.9% of the variance of patients' social well-being,  $F(10.217)=43.839$ ; and 64.4% of the variance of patients'

**Table 1. Correlations between the Coping Strategies and Sociodemographic and Medical Variables for Patients (n=228)**

Variables	Problem-focused coping	Emotion-focused coping
Age	-0.250**	-0.366**
Marital status	0.169*	0.211**
Educational level	0.254**	0.288**
Employment status	-0.286**	-0.253**
Monthly income	0.311**	0.167*
Time since diagnosis	0.181**	-0.644**
Recurrence	0.054	-0.362**
Stage of the illness	-0.441**	-0.340**

\*Correlation is significant at the 0.05 level (2-tailed); \*\*Correlation is significant at the 0.01 level (2-tailed)

**Table 2. Correlations between Quality of Life Variables and Sociodemographic, Medical Variables, and Overall Coping Strategies for Patients (n=228)**

Variables	Physical well-being	Psychological well-being	Social well-being	Spiritual well-being	Overall quality of life
Age	-0.421**	0.432**	0.319**	0.746**	0.664**
Marital status	0.296**	-0.178**	-0.090	-0.189**	-0.164*
Educational level	0.313**	-0.341**	-0.288**	-0.500**	-0.510**
Employment status	-0.464**	0.154**	0.119	0.540**	0.255**
Monthly income	0.344**	-0.143*	-0.109	-0.469**	-0.252**
Time since diagnosis	-0.080	0.755**	-0.578**	0.166*	0.418**
Recurrence	-0.018	0.433**	-0.632**	-0.087	0.041
Stage of the illness	-0.659**	0.250**	0.060	0.425**	0.186**

\*Correlation is significant at the 0.05 level (2-tailed); \*\*Correlation is significant at the 0.01 level (2-tailed)

**Table 3. Multiple Regression Analyses Predicting Patient Quality of Life from Sociodemographic, Medical Variables, and Overall Problem and Emotion Focused Coping Strategies (n=228)**

Variables	Physical well-being		Psychological well-being		Social well-being		Spiritual well-being	
	B	$\beta$	B	$\beta$	B	$\beta$	B	$\beta$
Constant	24,198		69,268		21,951		-90,612	
Age	0.014	0.010	0.940	0.271*	1,012	0.559*	1,629	0.905*
Marital status	1,387	0.058	-1,165	-0.019	2,924	0.092	2,384	0.076
Educational level	-0.630	-0.074	-3,832	-0.179	-0.347	-0.031	2,958	0.265**
Employment status	-3,873	-0.204*	-5,021	-0.105	-3,253	-0.130	2,704	0.108
Monthly income	-0.575	-0.042	4,942	0.144	2,025	0.113	-1,980	-0.111
Time since diagnosis	-0.789	-0.106	7,581	0.403*	-6,352	-0.645*	-0.657	-0.67
Recurrence	0.760	0.068	3,480	0.123	-4,291	-0.289*	0.912	0.062
Stage of the illness	-3,451	-0.275*	-2,378	-0.075	-0.377	-0.023	2,466	0.150
Emotion-focused coping	1,185	0.085	-12,308	-0.351*	-3,347	-0.183*	2,834	0.155
Problem-focused coping	7,085	0.616*	1,597	0.055	0.025	0.002	3,499	0.232*
R <sup>2</sup>	73.8%		75%		66.9%		64.4%	
F	61.224*		65.196*		43.839*		39.277*	
$\Delta R^2$ (adding emotion-focused coping)	0.000		0.063*		0.017**		0.009	
$\Delta R^2$ (adding problem-focused coping)	0.244*		0.002		0.000		0.035*	
$\Delta F$ (adding emotion-focused coping)	0.173		54.511*		10.909**		4.977	
$\Delta F$ (adding problem-focused coping)	202.363*		1,695		0.001		21.094*	

\*p&lt;0.0005; \*\*p&lt;0.001

spiritual well-being,  $F(10,217)=39.277$  ( $p<0.0005$ ).

The individual contributions of the multiple variables in the model for patients' quality of life were given in Table 3. To test which type of coping (i.e., problem-focused vs emotion-focused) accounted for more variance in patient quality of life scores, each was entered last into the model. Results showed that the addition of problem-focused coping to the prediction of physical well-being led to a statistically significant increase in R<sup>2</sup> of 0.244  $F(1, 217)=202.363$ ,  $p<0.0005$ . However, emotion-focused coping did not lead any significant increase in R<sup>2</sup>. Problem-focused coping accounted for more variance in patient physical quality of life above and beyond all other variables (an additional 24.4%) suggesting that problem-focused coping has a strong association with patients' physical quality of life.

For the prediction of psychological well-being, only the addition of emotion-focused coping led to a statistically significant increase in R<sup>2</sup> of 0.063  $F(1, 218)=54.511$ ,  $p<0.0005$ . The addition of emotion-focused coping to the prediction of social well-being also led to a statistically significant increase in R<sup>2</sup> of 0.017  $F(1, 218)=10.909$ ,  $p<0.001$ . Problem-focused coping did not lead any significant increase in R<sup>2</sup> for social well-being. Multiple regression analyses also showed that only the addition of problem-focused coping to the prediction of spiritual well-being led to a statistically significant increase in R<sup>2</sup> of 0.035  $F(1, 217)=21.094$ ,  $p<0.0005$ . Problem-focused coping accounted for a substantial amount of variance in patients' both physical and spiritual well-being and emotion-focused coping accounted substantial amount of variance in patients' both psychological and social well-being.

To assess the direction of the interaction, standardized coefficients ( $\beta$ ) among variables were also examined. Results indicated that patients' problem-focused coping related with both higher physical ( $\beta=0.616$ ) and spiritual ( $\beta=0.232$ ) well-being, while patients' emotion-focused coping related to lower psychological ( $\beta=-0.351$ ) and social ( $\beta=-0.183$ ) well-being.

## Discussion

The present study examined the utilization of both problem and emotion focused coping strategies and their association with four dimensions quality of life (physical, psychological, social and spiritual) among 228 women with ovarian cancer who are on chemotherapy.

Coping strategies and quality of life scores of patients were described at the outset. The problem-focused coping strategies most frequently used, in this study, were acceptance, using emotional support, and religion. An encouraging finding from the present study was that the acceptance was the most frequently used coping strategy by patients, and this finding also reported in other studies (Butow et al., 2013; Price et al., 2013). Acceptance implies an active attempt to learn to live with the cancer and the reality of one's situation. Emotional support was the second and religion was the third most commonly coping strategy and positive reframing followed them. All of these four coping efforts might help patients to accept their conditions, hence encouraging them to reframe the illness to become more positive-minded. Like many other studies of such nature, religious belief was the major coping strategy used to confront most particular chronic diseases (Ramirez et al., 2012; Harris et al., 2013). These strategies seemed to help patients reform their views on the cancer, and consequently, facilitate them to overcome cancer related problems. Some may even consider the illness as their 'destiny' and 'God's test', therefore surrendering themselves to their fate (Harris et al., 2013) through acceptance. Patients of the research were also seeking emotional support, which emphasize the role of families' emotional and instrumental backings in helping patients to adapt to their health situation.

Using of self-distraction, venting, and behavioral disengagement considered emotion-focused strategies were also reported by patients. Coping with cancer by means of self-distraction, behavioral disengagement, or venting of emotions are associated with poor quality of life outcomes. Behavioral disengagement can result in a

reduction of the effort a person invests in dealing with a stressor and can involve withdrawal and avoidance of contact with others. Avoidance of this type has been associated with negative medical outcomes longitudinally for men and women with cancer (Epping-Jordan et al., 1994; Collie et al., 2005). Self-distraction is characterized by such things as daydreaming and sleeping to separate oneself from a stressor and has been shown to be related to increased risk of traumatic stress (Carver, 1997). Although affect regulation and the expression of a range of emotions are considered to be beneficial for women with cancer, venting, as an excessive negative emotional expression, has not been associated with positive outcomes in previous cancer research (Culver et al., 2002). In fact, venting has been associated with higher distress for women with ovarian cancer (Geirdal and Dahl, 2008).

Although self-distraction, venting, and behavioral disengagement, as emotion-focused coping efforts, were used by patients of the study, patients reported using significantly more problem-focused coping rather than emotion-focused coping. These findings suggest that most of the women positively appraised their demanding and threatening illness and attempted to develop effective coping strategies to improve their quality of life.

Coping theorists often emphasize the benefits of problem-focused coping, such as acceptance, positive reframing, using instrumental or emotional support and religion (Lazarus and Folkman, 1984). A considerable number of research with various cancer patients show that an increase in the functioning of problem-focused coping in patients with cancer decreases anxiety, depression, and hopelessness, and stimulates quality of life (Ramanakumar et al., 2005; Reid et al., 2011; Wang et al., 2012; Gunusen et al., 2013; Price et al., 2013). Our research provided some evidence for such benefits, in those patients with ovarian cancer.

Overall quality of life score and its sub-scales were determined to be moderately high in the study. This finding is consistent with prior findings. Ersek et al. (1997) found that the scores on the quality of life instrument remained moderately high for the ovarian cancer patients, "despite some negative facets of the illness and treatment experience". In other studies, ovarian cancer patients also reported relatively good quality of life when compared with the general population (Kornblith et al., 2010; von Gruenigen et al., 2010). In this study, spiritual well-being of women was found highest among the other sub-scales of quality of life. In previous research, Wenzel et al. found that almost half of the sample reported high spiritual quality of life similar to controls. Spiritual well-being is positively associated with personal growth and ability to integrate the cancer experience (Wenzel et al., 2002). Woman with ovarian cancer also reported that spirituality helped them discern meaning from their cancer experience and maintain hope, and that their faith was important to them as it brought comfort and strength (Kornblith et al., 2010).

We investigated whether there were correlations between the coping strategies and sociodemographic, and medical variables for patients. Statistically significant relationships have found among these variables and

younger, married, more educated, employed, earlier staged of cancer patients used more frequently both problem and emotion focused coping mechanisms. This finding is consistent with a previous research with 100 women diagnosed with breast cancer. (Schnoll et al., 1998) Researchers found that younger women and women with an earlier disease stage used greater levels of the coping strategy characterized as a fighting spirit which, in turn, were related to better psychological adjustment.

The correlations between quality of life variables and sociodemographic, and medical variables for patients were also examined. Older, married, less educated, unemployed, not newly diagnosed and a higher staged of cancer patients' overall quality of life scores were found to be higher. Younger patients' overall quality of life and particularly, psychological and spiritual well-being scores were found to be lower and this finding is consistent with prior findings. Although younger age at diagnosis is associated with better physical functioning (Champion et al., 2007), young ovarian cancer patients have lower quality of life scores when compared with older patients (Bodurka-Bervers et al., 2000; von Gruenigen et al., 2010). Consistent with our findings, previous studies have also reported that number of chemotherapy cycles and duration of cancer significantly positively associated with cancer patients' quality of life. For example, in a study assessing factors affecting quality of life in cancer patients undergoing chemotherapy, it was found that the majority of the patients who had completed three or more cycles of chemotherapy and a longer time spent with cancer reported a favorable level of quality of life (Heydarnejad et al., 2012). This may show that quality of life is directly related to a cancer treatment process and time spent with cancer diagnosis.

One of the most important findings of this study was that the coping strategies used by patients with ovarian cancer accounted for a significant amount of variance in their quality of life. While a limited number of previous research have reported a univariate association between coping strategies and quality of life in women with breast and gynecological cancers (Kershaw et al., 2004), it is important that within multivariate analyses, coping strategies retained their significant relationship with ovarian cancer patients' quality of life. Problem-focused coping accounted for a substantial amount of variance in patients' both physical and spiritual well-being and emotion-focused coping accounted substantial amount of variance in patients' both psychological and social well-being.

Multiple regression analyses showed that the two domains of quality of life (physical and spiritual well-being) significantly positively associated with problem-focused coping and two of them (psychological and social well-being) negatively associated with emotion-focused coping. As hypothesized, problem-focused coping strategies associated with better quality of life, whereas emotion-focused strategies associated with poorer quality of life. These findings highlight the importance of assessing the coping strategies used by patients because of their significant association with quality of life. Consonant to our findings, in studies with various cancer

patients, active coping strategies were also associated with more positive health outcomes (e.g., Dukes Holland and Holahan, 2003).

The negative association among emotion-focused coping and psychological and social well-being suggest that this type of coping may have a harmful effect on patients' quality of life. This finding is similar with that of other studies, in which findings also indicate significant negative associations between emotion-focused coping and psychological health (Butow et al., 2013; Price et al., 2013). Emotion-focused coping mechanisms, such as self-distraction, venting and behavioral disengagement may decrease the potential capacity of problem solving of cancer patients. However, in this study, emotion-focused coping strategies were used less frequently compared to problem-focused coping by patients.

Supported by previous studies, active coping has been shown to be more functional, whereas the avoidant coping was rather dysfunctional and could lead to withdrawal, fatalistic attitudes and avoidance of problems. These coping strategies were directed at efforts to either solve or manage problems, including strategies for gathering information, making decisions, planning and resolving conflict (Folkman and Moskowitz, 2004). It has also been suggested that cancer, as an enduring and a long-term stressor, require problem-focused strategies because continuous use of avoidant coping efforts would only prevent change and consume substantial effort, which over time, could deplete the individual's psychological and physical resources (Asuzu and Elumelu, 2013). A better understanding of how patients cope with ovarian cancer is needed in order to develop new approaches to improve the unique illness experience of the patients. Individuals lacking a satisfactory level of quality of life could be helped by providing specific interventions, either by social services or by the mobilization of community resources such as self-help or support groups, particularly those formed by fellow survivors.

In conclusions, because of the non-random and relatively small sample size of this study, the generalizability of the results may be limited. The greatest limitation of the present study was the heterogeneous sample with respect to stage, recurrence status, and time since diagnosis. However, these variables were controlled in the analysis. This study also used a cross-sectional design, which investigates the real world at one point in time. Such a design does not inspect longitudinal fluctuations in coping strategies or quality of life. Thus, longitudinal research is needed to examine psychosocial factors among women with ovarian cancer.

Coping strategies are influential in patients' quality of life and their psychosocial adaptation to ovarian cancer. Psycho-oncology support programs are needed to help patients to frequent use of problem-focused coping and reduce emotion-focused coping strategies to improve overall quality of life. In conclusion, findings of the study point to the significance of taking individual coping strategies into account when evaluating the impact of cancer on quality of life. Delineation of coping strategies might be useful for identifying patients in need of particular counselling and support.

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