

Stress/Anxiety & Depression levels in oncological patients' support environment focusing on postoperative care: A prospective study

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Abstract

Cancer is a disease with high mortality and morbidity rates. It affects both patients and their families, physically and emotionally. To demonstrate the depression, anxiety and stress level, which the support environment (SP) experience after a

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cancer surgery. Prospective study designed to evaluate and correlate depression, anxiety and stress of SP –through D.A.S.S. scale 42-items- during postoperative care of oncological patients. From December 2013 until May 2014, 323 adult SP, whose patients suffering and surgically treating for cancer, were asked. The stress level of SP was not significantly correlated with gender, marital status or educational level ($\chi^2 = 2.892$, $df = 4$, $p = .575$, $\chi^2 = 14.244$, $df = 12$, $p = .285$, $\chi^2 = 6.959$, $df = 12$, $p = .860$, retrospectively). Evaluation of the pain has occurred with VAS scale, so the day of surgery SPs' depression, anxiety and stress was correlated $\rho = .141$, $p = .011$, $\rho = .154$, $p = .005$, $\rho = .145$, $p = .009$, retrospectively. There was a significant correlation between the complications and SP' anxiety and stress level ($\chi^2 = 387.477$, $df = 34$, $p < .001$, $\chi^2 = 286.529$, $df = 37$, $p < .001$, retrospectively). SP's focused interventions need to be developed and evaluated to determine the type of approaches that help SP supports patient, in postoperative period.

Keywords: caregivers, stress and anxiety in caregivers, depression of caregivers

1 Introduction

Cancer is a disease with high mortality and morbidity rates, and thus, coping with it, it is difficult. It affects both patients and their families, physically and emotionally. It is one of the main health problems, since it may lead to death; it affects people of all age groups throughout the world, makes the person dependent on others and affects both patients and their families adversely [1,2]. It is well known that due to cancer, not only patients' but also family members' daily living pattern is interrupted and that cancer patients' families suffer from stress as well. Once the cancer diagnosis is established, family members should struggle with the challenges arising due to cancer and undertake the role of caregiving [1-4]. Much research has documented both negative emotional and physical health conditions that may result from providing care to a family member with an illness [5]. However, little has been done in family caregiving, particularly in surgical oncology, to evaluate pathways in which biological and behavioral responses to stress may interact [5]. Previous studies suggest that support environment (SP) of patients who are critically ill, experience a high level of stress, anxiety, and depression levels [6,7]. But there are not many studies that demonstrate the stress and anxiety, which SP experience after a cancer surgery whether there is body image change involved (such as colostomy or mastectomy) or not. In an attempt to investigate this issue, a survey of SP was performed to investigate the stress, anxiety and depression of this sensitive group, so as nurses to be in a position to support SP through postoperative course of patient and provide guidance after patient is being discharged.

2 Material and Methods

This is a prospective study designed to evaluate and correlate depression, anxiety and stress levels of SP during postoperative care of oncological patients. From December 2013 until May 2014, 323 adult SP, whose patients suffered and were surgically treated from breast, colorectal, thyroid and liver cancer, were asked. SPs were parents, husband, wife and children.

In order to ensure the statistical power of the research's sample size, the method of 'Power Analysis' was performed. Power analysis was conducted by using the G* Power 3.1.9.2 software, and the parameters used were the effect size $d=.2$, $\alpha=.05$ and power $=.95^8$. This procedure resulted in a sample size $N=272$ that could lead the research to statistically significant results.

The protocol was approved by the Scientific Committee of the Hellenic Anticancer Institute at Saint Savvas Hospital, Athens, Greece. In order to participate in the protocol, consent was asked and taken from all participants. A full respect of the confidentiality of information throughout the collection and procession of the data was guaranteed.

The following demographics were collected: gender, age, and diagnosis of illness, cause of hospitalization of patients, as well as gender, age, marital status and region of residence of SP. Finally, frequency of peri-operative complication rate and length of hospitalization were correlated to stress/anxiety levels of SP, specifically it examined the levels of stress and anxiety of SP in correlation with the complications that patients suffered after surgery.

Statistical analysis was carried out by SPSS 22 (IMB SPSS Software, Chicago, Illinois), conducting Kolmogorov-Smirnov test of Normality. Comparisons were made using the chi-square test and Spearman rho. The data are expressed as mean \pm SD, in significant level .05.

Pain assessment was made with the Visual Analogue Scale (VAS), which is a self-measurement instrument. The VAS scale is usually a horizontal line (in length 10 cm) anchored by a word descriptor at each end and cannot be easily measured directly and by which pain assessment was made. The intensity of pain is measured as follows: no pain (score of 0), bad or worst imaginable pain (score of 10)[9].

Postoperative morbidity was assessed by the standard classification scale, the Clavien- Dindo classification of surgical procedures. The basic principle of this classification is based on the therapy needed to treat the complication. To standardize surgical outcome reporting, it introduced a classification of surgical complications consisting of five grades. The classification mainly focuses on the medical perspective, with major emphasis on the risk and invasiveness of the therapy used to correct a complication [10].

The Depression, Anxiety and Stress Scale (D.A.S.S.) are a 42 questionnaire which includes three self report scales designed to measure the negative states of

depression, anxiety and stress. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation and lack of interest/involvement, anhedonia and inertia. DASS subscale for depression levels takes values: 0-9 "normal", 10-13 "mild," 14-20 "Moderate", 21-27 "Severe", 28+ "Extremely severe". Autonomic arousal, skeletal muscle effect, situational anxiety and subjective experience of anxious affect are assessed by the anxiety scale. The subscale for anxiety takes values: 0-7 "normal", 8-9 "mild," 10-14 "Moderate", 15-19 "Severe", 20+ "Extremely severe". Sensitivity to levels of chronic non-specific arousal and assessment of difficulty in relaxing, nervous arousal and getting easily upset/ agitated, irritable/over reactive and impatience, is conducted by stress scale. The values for stress subscale are: 0-14 "normal", 15-18 "mild," 19-25 "Moderate", 26-33 "Severe", 34+ "Extremely severe".

Respondents are asked to use 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week and was validated for use in Greece. The Greek translation was made by Lyrakos et al, 2011 [11,12]. The permission to use the questionnaire was given by the same researchers.

3 Main Results

The response rate of the participants was 100% and the Cronbach 's alpha for the D.A.S.S. scale $\alpha = 0.969$, while Cronbach 's alpha for subscales is $\alpha_{\text{depression}} = 0.932$, $\alpha_{\text{anxiety}} = 0.911$, $\alpha_{\text{stress}} = 0.932$ [12].

Demographic Data

The demographic data of patients and SP are shown in Table 1. Also, the cause of hospitalization as well as the kind of surgery is demonstrated in Table 2.

The mean score of DASS Depression was 8.34 (SD=8.49), of DASS Anxiety was 8.37 (SD=8.47) and DASS Stress was 10.91 (SD=9.67) (Table 3). The depression level of SPs was cross tabulated, but it was not significantly correlated with their gender, educational level or their marital status ($\chi^2 = 9.019$, $df = 4$, $p = 0.061$, $\chi^2 = 15.399$, $df = 12$, $p = 0.22$, $\chi^2 = 9.827$, $df = 12$, $p = 0.631$, respectively). The anxiety level of SP was cross tabulated and there was not significantly correlated with the above parameters ($\chi^2 = 4.674$, $df = 4$, $p = 0.322$, $\chi^2 = 9.363$, $df = 12$, $p = 0.672$, $\chi^2 = 8.831$, $df = 12$, $p = 0.717$, respectively). Furthermore, the stress level of SP was not significantly correlated with the factors which are mentioned above ($\chi^2 = 2.892$, $df = 4$, $p = 0.575$, $\chi^2 = 14.244$, $df = 12$, $p = 0.285$, $\chi^2 = 6.959$, $df = 12$, $p = 0.860$, respectively).

Cross tabulation

SP was completed DASS scale, whose results were cross tabulated with which level they worried: a. *that patient hospitalized in an oncological hospital*, b. *patient has been informed about his disease and the therapy which is necessary to be followed* and c. *if they have to participate in patient' care after his discharge*.

The results are shown in Table 4.

Correlations

There was a light correlation between SP' depression, anxiety and stress level and the pain that patient felt the day of the surgery, the 1st and 2nd postoperative day, as well as the following days of hospitalization. Evaluation of the pain has occurred with VAS scale, so the day of surgery for depression, anxiety and stress was $\rho=0.141$, $p=0.011$, $\rho=0.154$, $p=0.005$, $\rho=0.145$, $p=0.009$, respectively, the 1st postoperative day $\rho=0.211$, $p<0.001$, $\rho=0.179$, $p=0.001$, $\rho=0.199$, $p<0.001$, respectively with the results of the DASS scale (depression, anxiety and stress). However, the 2nd postoperative day, there was a moderate correlation with SP' depression, anxiety and stress level $\rho=0.206$, $p<0.001$, $\rho=0.204$, $p<0.001$, $\rho=0.202$, $p<0.001$, respectively, while a statistical correlation was noted for pain that patients felt the following days of hospitalization level $\rho=0.211$, $p<0.001$, $\rho=0.181$, $p=0.001$, $\rho=0.202$, $p<0.001$, respectively. Correlations were made using Spearman factor (ρ), in significant level $p=0.01$.

Thirty-seven out of 46 patients had minor complications (Clavien- Dindo classification grade I & II) while 10 patients were characterized by grade IIIb of Clavien-Dindo classification. There was a significant correlation between the complications and the SP' anxiety and stress level ($\chi^2=387.477$, $df=34$, $p<0.001$, $\chi^2=286.529$, $df=37$, $p<0.001$, respectively).

There was statistically significant positive correlation between the postoperative length of stay of patient with SPs' depression, anxiety and stress level ($\rho=0.168$, $p=0.002$, $\rho=0.17$, $p=0.002$, $\rho=0.272$, $p=0.004$, respectively).

Last but not least, it was correlated that SPs' depression, anxiety and stress level with the body image change of patient, more specifically patients who had undergone mastectomy or creation of a stoma. The depression level of SP was cross tabulated and 11.5% was mild depressed, while 11.5%, 7.7%, 4.8% were moderate, severe and extremely depressed, respectively, when a body image has changed, but was not significantly correlated ($\chi^2=3.011$, $df=4$, $p=0.556$). The anxiety level of SP was cross tabulated and 10.6% was mild anxious, while 16.3%, 11.5%, 9.6% were moderate, severe and extremely anxious, respectively, when a body image had changed, but was not significantly correlated ($\chi^2=4.472$, $df=4$, $p=0.346$). On the other hand, the stress level of SP was cross tabulated and 12.5% was mild stressed, while 11.5%, 9.6%, 3.8% were moderate, severe and extremely depressed, retrospectively, when a body image has changed, whilst it was significantly correlated ($\chi^2=10.033$, $df=4$, $p=0.04$) (Table 4).

4 Labels of tables

Table 1. Demographic data of patients and SP

N(%)	Patients	SPs
Gender		
Male	96(29.7)	88(27.2)
Female	227(70.3)	235(72.8)
Age (quartiles)		
25	48	38
50	57	49
75	69	59
Marital status		
Single	55(17)	80(24.5)
Married	229(70.9)	219(67.8)
Divorced	36(11.1)	6(1.9)
Widower	3(0.9)	18(5.9)
Educational level		
No education	8(2.5)	5(2.2)
elementary	93(28.8)	60(18.3)
Secondary education	116(35.9)	194(60.3)
Higher education	106(32.8)	64(18.3)
Residency		
Rural	209(64.7)	46(14.2)

Non urban	50(15.5)	41(12.7)
Urban	64(19.8)	236(73.1)

Table 2. Patients' cause of hospitalization and kind of surgery

Cause N (%)	of hospitalization
Breast cancer	99(30.7)
Colorectal cancer	69(21.3)
Liver cancer	10(3.1)
Pancreatic cancer	9(2.8)
Ovarian cancer	28(8.7)
Other type of cancer	108(33.4)
Kind of surgery	
Abdominal surgery	165(51.1)
Mastectomy	58(18)
Lumpectomy	36(11.1)
Other type of surgery	64(19.8)

Table 3. DASS sub-scales mean scores

DASS Sub-scales	N	Mean	Std. Deviation
DASS DEPRESSION	323	8.34	8.491
DASS ANXIETY	323	8.37	8.470
DASS STRESS	323	10.91	9.675

Table 4. SP responses' in DASS scale

%	DASS Depression					DASS Anxiety					DASS Stress					
	Normal	Mild	Moderate	Sever	Extremely severe	Normal	Mild	Moderate	Severe	Extremely severe	Normal	Mild	Moderate	Severe	Extremely severe	
Complications of patients																
Yes	56.9	11.8	11.8	15.7	3.9	4.9	11.8	15.7	7.8	15.7	58.8	17.6	11.8	9.8	2	
No	68	9.9	12.1	7	2.9	60.7	7	12.5	10.7	9.2	68	10.7	8.8	11.4	1.1	
Worried if patient hospitalized in an oncological hospital																
Yes	63.4	12	10.6	9.9	4.2	52.8	9.2	15.5	10.6	12	57.7	16.9	10.6	14.1	.7	
No	68.5	8.8	13.3	7.2	2.2	63.5	6.6	11	9.9	8.8	73.5	7.7	8.3	8.8	1.7	
Worried if patient is aware of disease																
Not at all	52.9	23.5	17.6	5.9	0	41.2	17.6	17.6	5.9	17.6	70.6	11.8	11.8	0	5.3	
Minimum	70	6.7	13.3	10	0	50	13.3	16.7	10	10	56.7	20	3.3	20	0	
well	66.7	15.4	5.1	12.8	0	56.4	10.3	20.5	10.3	2.6	64.1	7.7	15.4	12.8	0	
Very well	64.9	8.1	13.5	8.1	5.4	55.4	9.5	12.2	12.2	10.8	62.2	13.5	12.2	12.2	0	
Exactly	67.5	9.2	12.3	7.4	3.7	64.4	4.3	10.4	9.8	11	70.6	10.4	8	8.6	2.5	
Worried if SP has to participate in home care after discharge																
Yes	65.2	10.9	10.9	9.2	3.8	58.2	7.9	12	10.3	10.9	64.7	13.6	9.2	11.4	1.1	
No	67.6	9.4	13.7	7.2	2.2	59.7	7.9	12.9	10.1	9.4	69.1	9.4	9.4	10.8	1.1	

5 Discussion

Fear, anger, disappointment and sadness are common, throughout caregiving of cancer patients. However, caregivers potentially play an important role in caring for cancer patients. SPs desire more information on how to behave towards patients during postoperative care.[13]

The cancer patient's relatives and family constitute one of the patient's main sources of support throughout the disease. In recent years, several studies have emphasized the psychological vulnerability of caregivers with a high proportion suffering from anxiety, stress and depression symptoms. The literature underlines several factors of detrimental outcomes but critical aspects of the spousal relationship as attachment were neglected [14].

There have been many studies and systematic reviews which evaluated the depression, stress and anxiety in caregivers of children and adults with cancer, during chemotherapies, postoperative care or palliative care in hospice. These studies have shown to be stressed and anxious with great care burden [1-5]. Until recently, in Greece, there have not been many studies to demonstrate the anxiety and stress of supporting environment in cancer patients, focusing on postoperative care during hospitalization. To the best of our knowledge, this is the first prospective study on SPs psychological status during the above situation, in the Greek population.

This study observes the burden of SPs in postoperative care of oncological patients, such as how depressed, anxious or stressed, they felt. SPs showed to be stressed and anxious when patient suffered the postoperative days or appeared complications. Also, they appeared to be depressed and worried, for their relative hospitalized in an oncological hospital and the length of hospitalization. On the contrary, SP' depression, anxiety and stress level was independent to their educational level or their marital status. Of course, SPs' depression and anxiety was not correlated with the change of patient's body image, but felt severe or extremely severe stressed after the body image had changed.

In the present study, SPs appeared to have 11.5% moderate depression levels. In the study of Govina et al., 2015, it is shown that care giving burden affects the lives of family members providing care to patients with advanced cancer in Greece, with a variety of factors possibly contributing to this. SPs reporting greater depressive mood and difficulty with care giving tasks, those married and those not employed, and those who cared for patients who had not undergone surgery were found at greater distress and disadvantage. In a sample of 100 pairs of patients receiving palliative radiotherapy for advanced cancer and their respective primary family SPs were consecutively recruited at one radiotherapy session. Patients and caregivers completed a set of questionnaires during face-to-face interviews. Care giving burden was linked to both patient (gender, age, post surgery or chemotherapy treatment, depression and impact of cancer-related symptoms) and caregiver variables (gender, family status, education, place of residence, previous experience of care, employment status,

difficulty of care giving, anxiety and depression [15]. Unlikely, in our study, SPs' educational level or marital status was not correlated with their stress or anxiety level.

As well, pain is the most important symptom in terms of prevalence and a major cause of distress for cancer patients and their family caregivers. Cancer pain is one of the physical components that have tremendous impact on the quality of a patient's life. It is multifaceted and complex to understand and managing cancer pain involves a toolbox full of pharmacological and non pharmacological interventions; still there are 50-70% of cancer patients who suffer from uncontrolled pain and they fear pain more than death [16]. A cross-sectional and descriptive study was conducted in a chemotherapy unit and an adult oncology clinic with 220 patients diagnosed with cancer who were admitted to an oncology hospital and 220 caregivers. The study data was collected using a questionnaire and visual analogue scale (VAS, where "0: no pain," "10: severe pain"), like in our study. Pain severity as assessed by patients and their caregivers was 7.1 ± 2.8 and 7.3 ± 2.4 , respectively, and the most common pain-related problems in cancer patients were fatigue ($p < 0.05$), loss of appetite and insomnia ($p > 0.05$) as reported by both patients and SPs. Compared to their SPs, patients more frequently reported financial burden associated with pain management and negative effects of cancer pain in their work life and domestic life and family relationships, all of which were statistically significant ($p < 0.05$). The caregivers most commonly reported fatigue (56.8 %) in their role as a caregiver [17]. According to our study, SPs were felt depressed, anxious and stressed when patients felt pain, but it was not compared to patients' stress and anxiety or the care giving burden through domestic life and family relationships. In the present study, high levels of anxiety were observed when patients suffer from pain.

Furthermore, in another study of Sklenarova et al., 2015, the mean age of the caregivers was 57.8 years. Approximately 72.3% were female. Patients had an average age of 62.5 years, with 33.0% being male. Caregivers were more distressed ($p < .01$) and exhibited higher anxiety scores ($p < 0.01$) compared to patients. Approximately 14.4% of caregivers reported no unmet need and 43.6% had at least 10 needs that were unmet. The main caregiver concerns were regarding health care service and information needs followed by emotional and psychological needs. To some degree, unmet needs in patients and caregivers' anxiety predicted unmet caregiver needs. Sociodemographic and clinical variables were not found to be significant predictors [18].

Also, in the research of Yuen et al., 2015, SPs play a vital role in caring for people diagnosed with cancer. However, little is understood about caregivers' capacity to find, understand, appraise and use information to improve health outcomes. The study aimed to develop a conceptual model that describes the elements of cancer caregiver health literacy. Six concept mapping workshops were conducted with 13 caregivers, 13 people with cancer and 11 healthcare providers/policymakers. An iterative, mixed methods approach was used to analyze and synthesize workshop

data and to generate the conceptual model. Six major themes and 17 subthemes were identified from 279 statements generated by participants during concept mapping workshops. The findings demonstrate that caregiver health literacy is multidimensional. It includes a broad range of individual and interpersonal elements, and is influenced by broader healthcare system and community factors. These results provide guidance for the development of: caregiver health literacy measurement tools, strategies for improving health service delivery, and interventions to improve caregiver health literacy [19].

Lobchuk and Vorauer, (2003) report that one of the roles of nurses in contributing to a better adaptation of caregivers to their new functions, may have to do with asking caregivers to put themselves in the patient's shoes, or to imagine themselves as the ill person [20]. Oncology nurses should help caregivers to a better understand of their own physical and psychological needs so as to provide care to their beloved and cope with the new situation. After filling this gap, caregivers would understand their patients' symptoms and needs, and care provided to people with serious illnesses could improve their quality of life.

Nurses care intervention is feasible and acceptable. They are in the position to evaluate and improve provision, as far as they are aware of patients and SP emotions. Also, nurses could provide an advanced care planning after patient is being discharged and could coordinate care for the SPs.

7 Study limits

Although this research was carefully prepared, we are still aware of its limitations and shortcomings. First of all, the research was conducted in one oncological hospital which lasted for six months. Six months is not enough for the researcher to observe all the SPs and their needs. It would be better if it was done for a longer period.

Secondly, the population of the experimental group is small, only three hundred and twenty three SPs and might not represent the majority of SPs.

Thirdly, the SPs' depression, anxiety and stress level were not correlated with patients' one; it seems not to provide enough evidence of how family relationships interact, in such complicated care. In addition, extended research should be done, so as to have predictors; the health professionals would have the opportunity to intervene and support patients and SP, in a stressful and anxiety period, like the postoperative one.

8 Conclusion

Cancer not only affects patients but also their SP. The objective of the current study was to examine if there is a high level of depression, anxiety and stress of

cancer SP and to identify where there is a need for supportive care. SP's focused interventions need to be developed and evaluated by Nurses, so as to determine the type of approaches that help SP supports patient and themselves, in postoperative period.

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