Prevalence and predictors of anxiety and depression in women with invasive ovarian cancer and their caregivers

Melanie A Price, Phyllis N Butow, Daniel S J Costa, Madeleine T King, Lynley J Aldridge, Joanna E Fardell, Anna DeFazio, Penelope M Webb,
the Australian Ovarian Cancer Study Group and the Australian Ovarian Cancer Study Group Quality of Life Study Investigators

ABSTRACT

Objectives: To assess the prevalence and predictors of depression and anxiety in women with ovarian cancer and their caregivers, to compare levels of depression and anxiety with community norms, and to explore the relationship between patients and their nominated caregivers.

Design, setting and participants: Prospective cohort study of 798 women with invasive ovarian cancer recruited between 1 January 2002 and 30 June 2006 through the nationwide Australian Ovarian Cancer Study, and 373 of their caregivers.

Main outcome measures: Depression and anxiety as assessed with the Hospital Anxiety and Depression Scale, and the role of demographic variables, disease and treatment variables, psychosocial variables, and use of mental health and support services as potential predictors.

Results: Rates of anxiety and depression among patients were significantly lower than in previous reports, although clinical depression rates (5.9%) were significantly higher than community norms (3.0%; $\chi^2 = 24.0$; $P < 0.001$). Caregivers also reported higher levels of depression ($\chi^2 = 21.1$; $P < 0.001$) and anxiety ($\chi^2 = 17.6$; $P < 0.001$) compared with norms. There was no difference within patient–caregiver pairs for depression ($P = 0.1$), while caregivers reported significantly higher anxiety than patients ($P < 0.01$). In patients, higher symptom burden, lower optimism and current specialist mental health treatment all significantly predicted both depression and anxiety, while lower social support was a significant predictor of patient anxiety only. In caregivers, lower social support and lower optimism were significant predictors of depression and anxiety. Patients being treated for mental health was also a predictor of their caregiver's depression.

Conclusions: While depression is significantly more common in women with ovarian cancer than in the general population, it is caregivers of such patients who report much higher levels of both subclinical and clinical depression and anxiety.

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Ovarian cancer is the leading cause of death from gynaecological malignancies in Western countries and the fifth most common cancer causing death in women.[1] Psychological morbidity following a diagnosis of cancer is well documented;[2,3] up to 45% of patients with cancer experience clinically significant anxiety, and 25% experience clinically significant depression.[4] Among the few small and unrepresentative studies focusing on ovarian cancer, rates of clinical anxiety of 22%–29%, and of clinical depression of 17%–21% have been reported.[5] The impact of cancer on family members, in particular, spouses, is increasingly being recognised. Distress among caregivers is reported at 20%–30%, and as high as 50% in caregivers of patients with advanced disease or receiving palliative care.[6] Some studies suggest that caregiver anxiety and depression is often more common and more severe than that of the patients.[7]

Untreated anxiety and depression is associated with poor symptom control, non-adherence to treatment recommendations, and increased time in hospital.[8] Thus, it is critical to understand the antecedents of morbidity in order to provide appropriate services. Higher optimism in patients has been associated with better emotional well-being,[9] while feelings of hopelessness and absence of a partner are associated with higher depression in patients, both in the short term,[10] and long term.[4,11] However, no studies have explored the specific antecedents of distress in patients with ovarian cancer and their caregivers.

Timely access to professional services might be expected to alleviate distress. Concerningly, patients report receiving less advice and information about psychosocial support than health-related information.[12] The rate of participation in counselling or support groups among patients with cancer is reported at 14%–24%,[13,14] and only about 25% of distressed patients receive treatment.[15] Similarly, few caregivers seek out and receive additional psychosocial support.[16]

While patients report that they may have used services if they had known about them,[12] availability and access to mental health and other support services may influence actual uptake, especially in rural and regional areas.[17]

In this study, our aims were to:

- describe the prevalence of anxiety and depression in women with ovarian cancer and their caregivers, and compare with community norms;
- compare levels of anxiety and depression in patients and caregivers; and
- identify demographic, medical and psychological predictors of anxiety and depression in women with ovarian cancer and their caregivers.

METHODS

Patients participating in the Quality of Life (QoL) substudy of the Australian Ovarian Cancer Study (AOCS) were recruited through the AOCS. The AOCS is a population-based study of women aged 18–79 years newly diagnosed with primary ovarian cancer, fallopian tube cancer or peritoneal cancer between 1 January 2002 and 30 June 2006.[18] Women were recruited through major treatment centres and state-based cancer registries. The AOCS collected detailed ovarian cancer risk-factor data relating to the period ending 1 year before diagnosis, disease and initial treatment data, as well as ongoing treatment and clinical outcome data. The QoL substudy is investigating the role of psychosocial factors in predicting outcomes, collecting data by questionnaire at baseline and then every 3 to 6 months for up to 2 years. If more than one item on any questionnaire was missing, the participant was contacted to complete the items; missing psychosocial data are therefore minimal. In this article, we report data from baseline questionnaires only.

AOCS participants with invasive cancer who were alive in May 2005, or who were recruited into the AOCS after this date, were invited to participate. Consenting women were mailed an information statement, consent form, questionnaire booklet and a reply-paid envelope, and were asked to invite their caregiver into the study. Caregivers were contacted separately and were mailed the caregiver version of all study documents.

The study was approved by the Human Research Ethics Committees of the University of Sydney, the Queensland Institute of Medical Research and all participating sites.

Measures

The primary outcomes, anxiety and depression, were assessed using the Hospital Anxiety and Depression Scale (HADS).[19] This scale has two subscales which distinguish between anxiety and depression. Scores on each subscale delineate "normal" (score, 0–7), "subclinical" (score, 8–10), and "clinical" (score, 11–21) levels of anxiety and depression.

Predictor variables included those listed below.

Sociodemographic characteristics These included age, education and marital status, and were obtained from the AOCS for patients and by questionnaire for caregivers. Place of residence (major city or regional/remote) was determined from residential postcodes.

Disease, treatment and symptom burden data: Data on date of diagnosis and surgical stage (according to the International Federation of Gynecology and Obstetrics [FIGO]) at diagnosis were obtained through the AOCS. Current treatment type (chemotherapy, radiotherapy) was collected by questionnaire. Symptom burden was assessed by the 12-item additional concerns subscale of the Functional Assessment of Cancer Therapy–Ovarian scale.[20] Scores on this scale range from zero to 44, with higher scores indicating lower symptom burden.

Social support: This was assessed using the Duke University of North Carolina Functional Social Support Questionnaire.[21] Higher scores indicate greater support.

Optimism: This was assessed using the Life Orientation Test–Revised, a widely used measure of dispositional optimism.[22] Higher scores indicate higher optimism.

Treatment for mental health (patients only): Patients were asked if they had experienced mental health problems in the past 3

1 Demographic, disease and treatment, psychosocial, and support variables for 798 patients* and 373 carers*

	Patients		Carers	
Participant variables	Mean (SD)	Range	Mean (SD)	Range
Age (years)	60.0 (10.5)	22–82	57.9 (13.6)	20–86
Score				
Anxiety†	6.1 (4.3)	0–21	6.9 (4.1)	0–19
Depression†	3.7 (3.5)	0–21	4.1 (3.5)	0–15
Social support‡	34.6 (6.2)	12–40	31.9 (7.0)	12–40
Optimism§	15.9 (4.5)	0–24	15.3 (4.1)	3–24
Symptom burden¶**	33.9 (6.1)	0–34		
Time since diagnosis (months)**	18.7 (10.3)	3–56		
	Number		Number	
Carer in study**	373 (46.7%)			
Relationship of carer to patient				
Spouse/partner			267 (71.6%)	
Child			67 (18.0%)	
Sibling/friend			32 (8.6%)	
Mother			7 (1.9%)	
Sex				
Female	798 (100.0%)		101 (27.1%)	
Male	0		272 (72.9%)	
Marital status				
Current partner	563 (72.5%)		330 (88.7%)	
Former partner	164 (21.1%)		23 (6.2%)	
Never married	50 (6.4%)		19 (5.1%)	
Education				
School only	384 (49.2%)		103 (27.9%)	
Trade/technical	268 (34.3%)		176 (47.7%)	
University	129 (16.5%)		90 (24.4%)	
Place of residence				
Major city	507 (63.5%)		235 (63.2%)	
Regional/remote	291 (36.5%)		137 (36.8%)	
Mental health treatment in past 3 months**††				
No	636 (81.2%)			
Yes	148 (18.9%)			
Additional support services in past 3 months**‡‡				
No	513 (65.1%)			
Yes	267 (34.2%)			
FIGO stage at diagnosis**				
Early (I/II)	237 (30.2%)			
Advanced (III/IV)	547 (69.8%)			
Currently receiving active treatment**				
No	630 (78.9%)			
Yes	168 (21.1%)			

FIGO = International Federation of Gynecology and Obstetrics.
* Numbers in table may not add up to these totals because of missing data. † Hospital Anxiety and Depression Scale score. ‡ Duke University of North Carolina Functional Social Support Questionnaire score. § Life Orientation Test–Revised score. ¶ Score on the 12-item additional concerns subscale of the Functional Assessment of Cancer Therapy–Ovarian scale. ** Data available for patients only. †† By a psychiatrist or psychologist for mental health problems in the past 3 months. ‡‡ Use of additional support services (including social worker, other health professionals, support groups, education programs, relaxation/meditation) in the past 3 months.

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months, and, if so, if they had had any treatment (medication, counselling/cognitive behaviour therapy) and if they had seen a psychologist or psychiatrist. Responses were recoded as "yes" or "no/don't know."

Use of support services (patients only): Patients were asked if they had used any additional support services in the past 3 months. Responses included social worker, other health professionals, support groups, education programs, and relaxation/meditation. Responses were recoded as "yes" or "no/don't know."

Statistical analysis

Data were analysed using SPSS, version 17 (SPSS Inc, Chicago, Ill, USA). χ^2 tests were used to compare proportions of individuals whose scores indicated normal, subclinical or clinical anxiety and depression on the HADS subscales, compared with normative data[23] (these were British, as no Australian normative HADS data are currently available), and other categorical variables. The Wilcoxon test was used to directly compare patient–caregiver pairs on raw anxiety and depression scores. To examine predictors, anxiety and depression data were recoded as either normal or subclinical/clinical, and analysed using binary logistic regression, including demographic, disease and psychosocial variables as covariates.

RESULTS

A total of 798 eligible AOCS patients (66%) completed baseline questionnaires between 1 May 2005 and 31 December 2006. Patients were a mean age of 60 years (range, 22–82 years), most were married and most were diagnosed with advanced-stage (FIGO stage III/IV) disease (70%); they had been diagnosed an average of 19 months (range, 3–56 months) previously (Box 1). Twenty-one per cent were currently undergoing treatment. Responders and non-responders were similar in terms of age and marital status. Responders were more likely to have a university education (16%) than non-responders (10%), and, not surprisingly, responders were less likely to have advanced-stage disease at diagnosis (70%) than non-responders (77%). Of the nominated caregivers, 373 (88%) completed baseline questionnaires. Caregivers were a mean age of 58 years (range, 20–86 years) and 72% were male spouses (Box 1).

2 Participants categorised as having normal, subclinical and clinical anxiety and depression on the Hospital Anxiety and Depression Scale (HADS), and comparison with community norms

		Community norms*		Participants	
	HADS category	All	Female	Patients†	Carers‡
Anxiety	Normal	66.8%	62.0%	545 (68.6%)	215 (57.6%)
	Subclinical	20.6%	22.0%	130 (16.4%)	88 (23.6%)
	Clinical	12.6%	16.0%	119 (15.0%)	70 (18.8%)
				χ^2 for patient v female norms	χ^2 for carer v all norms
				17.6 ($P < 0.001$)	17.6 ($P < 0.001$)
Depression		All	Female	Patients†	Carers‡
	Normal	88.6%	89.0%	677 (85.3%)	303 (81.2%)
	Subclinical	7.8%	8.0%	70 (8.8%)	51 (13.7%)
	Clinical	3.6%	3.0%	47 (5.9%)	19 (5.1%)
				χ^2 for patient v female norms	χ^2 for carer v all norms
				24.0 ($P < 0.001$)	21.1 ($P < 0.001$)

* From Crawford et al.[23] † All patients were female, so patient sample proportions were compared with female community norms. ‡ 73% of carers were male and 27% were female, so carer sample proportions were compared with combined male and female ("all") community norms. There were no significant differences between male and female carers on levels of anxiety ($P = 0.2$) or depression ($P = 0.2$). Male carers were more likely to report subclinical and clinical levels of anxiety than males in the general community ($\chi^2 = 26.9$; $P < 0.01$) and were more likely to report subclinical and clinical levels of depression than males in the general community ($\chi^2 = 52.1$; $P < 0.01$). Female carers were comparable to females in the general community for anxiety ($P = 0.1$) and depression ($P = 0.9$).

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Anxiety and depression in comparison with community norms

The proportions of patients and caregivers categorised as having normal, subclinical or clinical levels of anxiety and depression were all significantly different to community norms. Box 2 shows that, while clinical levels of anxiety in patients were comparable to female norms (patients, 15.0% v norms, 16.0%), patients reported less subclinical anxiety than female norms (patients, 16.4% v norms, 22.0%; $\chi^2[3] = 17.6$; $P < 0.001$). Conversely, while comparable on subclinical depression (patients, 8.8% v norms, 8.0%), the rate of clinical depression in patients was double that for community norms (patients, 5.9% v norms, 3.0%; $\chi^2[3] = 24.0$; $P < 0.001$).

Rates among caregivers of subclinical anxiety (caregivers, 23.6% v norms, 20.6%) and clinical anxiety (caregivers, 18.8% v norms, 12.6%) were higher than community norms ($\chi^2[3] = 17.6$; $P < 0.001$). The pattern for depression was similar ($\chi^2[3] = 21.1$; $P < 0.001$), with a higher rate among caregivers of subclinical depression (caregivers, 13.7% v norms, 7.8%) and clinical depression (caregivers, 5.1% v norms, 3.6%) than norms. Direct comparison between patients and their nominated caregivers on raw anxiety and depression scores showed that patient anxiety scores were significantly lower those of their caregivers (mean patient score, 7 v mean caregiver score, 6; Wilcoxon statistic $[W][370] = 9240$; $P < 0.01$), while patient–caregiver depression scores were comparable ($W[371] = 5542$; $P = 0.1$).

Predictors of subclinical and clinical anxiety and depression

The results of multivariate analyses of demographic, medical and psychosocial predictors of subclinical or clinical anxiety and subclinical or clinical depression in patients and caregivers are shown in Box 3. For patients, lower optimism, higher symptom burden and current mental health treatment were significant predictors of both anxiety and depression, while lower social support was a significant predictor of patient anxiety only. Demographic variables, including place of residence and medical variables (including stage, treatment and time since diagnosis) were not associated with anxiety or depression. For caregivers, lower social supportand lower optimism were independent predictors of both anxiety and depression. Younger age was an additional predictor of caregiver anxiety (not

3 Odds ratios* and 95% confidence intervals for demographic, disease and psychosocial predictors of subclinical or clinical anxiety and depression in patients and carers

	Patients		Carers	
Predictors	Anxiety	Depression	Anxiety	Depression
Age				
≤ 49 years	1.00	1.00	1.00	1.00
50–59 years	0.88 (0.49–1.58)	0.96 (0.43–2.15)	0.66 (0.30–1.48)	0.56 (0.20–1.55)
60–69 years	0.92 (0.51–1.67)	1.09 (0.49–2.45)	0.34 (0.14–0.80)[‡‡]	0.38 (0.32–1.10)
≥ 70 years	0.53 (0.26–1.09)	0.89 (0.35–2.25)	0.31 (0.12–0.79)[‡‡]	0.54 (0.18–1.60)
Marital status				
Current partner	1.00		1.00	
Former partner	0.72 (0.43–1.18)	1.00 (0.54–1.88)	0.72 (0.22–2.36)	1.60 (0.40–6.44)
Never married	1.35 (0.61–2.97)	0.54 (0.17–1.76)	0.64 (0.18–2.27)	1.54 (0.26–9.26)
Education				
School only	1.00		1.00	
Trade/technical	1.00 (0.56–1.78)	0.93 (0.43–2.01)	1.13 (0.54–2.36)	0.52 (0.19–1.44)
University	1.33 (0.87–2.04)	0.88 (0.49–1.52)	1.49 (0.80–2.79)	1.31 (0.60–2.86)
Place of residence				
Major city	1.00			
Regional/remote	0.96 (0.64–1.44)	0.83 (0.48–1.44)	0.62 (0.36–1.08)	1.22 (0.61–2.43)
FIGO stage at diagnosis				
Early (I/II)	1.00			
Advanced (III/IV)	1.16 (0.74–1.81)	0.90 (0.49–1.66)		
Months since diagnosis	1.00 (0.98–1.02)	0.99 (0.96–1.02)		
Patient currently receiving active treatment				
No	1.00		1.00	
Yes	1.21 (0.74–1.99)	0.94 (0.51–1.72)	1.10 (0.59–2.07)	0.76 (0.35–1.68)
Social support[†]	0.94 (0.91–0.97)[§§]	0.96 (0.92–1.00)	0.90 (0.86–0.94)[§§]	0.87 (0.83–0.92)[§§]
Optimism[‡]	0.84 (0.80–0.89)[§§]	0.92 (0.87–0.98)[‡‡]	0.84 (0.77–0.90)[§§]	0.89 (0.81–0.98)[¶¶]
Symptom burden[§]	1.09 (1.05–1.13)[§§]	1.23 (1.17–1.29)[§§]		
Patient mental health treatment in past 3 months[¶]				
No	1.00		1.00	
Yes	2.51 (1.56–4.03)[§§]	2.54 (1.42–4.53)[¶¶]	0.88 (0.42–1.83)	2.71 (1.19–6.16)[‡‡]
Patient additional support services**				
No	1.00			
Yes	1.34 (0.89–2.03)	1.46 (0.86–2.48)		
Relationship of carer to patient				
Spouse/partner			1.00	
Child			1.28 (0.53–3.09)	0.09 (0.03–0.38)[§§]
Sibling/friend			0.68 (0.25–1.90)	0.52 (0.14–1.90)
Mother			1.30 (0.16–10.63)	0.77 (0.07–8.77)
Patient distress[††]			1.03 (0.98–1.08)	1.04 (0.98–1.11)
Interaction between patient distress and patient mental health treatment			1.01 (0.93–1.11)	1.00 (0.91–1.10)

FIGO = International Federation of Gynecology and Obstetrics.

* Obtained from binary logistic regression analysis with all the listed variables included as covariates in the same analysis. † Duke University of North Carolina Functional Social Support Questionnaire score. ‡ Life Orientation Test–Revised score. § Score on the 12-item additional concerns subscale of the Functional Assessment of Cancer Therapy–Ovarian scale; data available for patients only. ¶ By a psychiatrist or psychologist for mental health problems in the past 3 months. ** Use of additional support services (including social worker, other health professionals, support groups, education programs, relaxation/meditation) in the past 3 months. †† Hospital Anxiety and Depression Scale score. ‡‡ *P* < 0.05. §§ *P* < 0.001. ¶¶ *P* < 0.01.

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depression) and current mental health treatment of the patient was an additional predictor of caregiver depression (not anxiety), while children caring for a patient reported significantly lower depression than a partner caring for a patient.

Place of residence, mental health treatment and support services

Although women attending major treatment centres are likely to be over-represented in the AOCS, in our sample, there were no significant differences in the prevalence of anxiety or depression (i) between participants living in different states or (ii) between participants living in Queensland, South Australia, Western Australia, Tasmania, the Australian Capital Territory and Northern Territory, where treatment centres are more centralised, and participants living in New South Wales and Victoria, where treatment centres are less centralised (data not shown).

Contrary to expectation, there were no differences in anxiety, depression, social support or optimism between patients and caregivers living in major cities and regional/remote locations. The proportion of the 108 major city patients having mental health treatment (75.0%) was similar to that among the 51 regional/remote patients (60.8%; $\chi^2[1] = 3.36$; $P = 0.09$). Similarly, the proportions of major city patients (53.7%) and regional/remote patients (39.2%) using additional support services were not significantly different ($\chi^2[1] = 2.91$; $P = 0.09$). From among the 134 patients reporting clinical levels of anxiety or depression (17%), only 65 (48.5%) reported current mental health difficulties, and of these, only 45 (33%) were receiving specialist treatment for mental health (medication or counselling/cognitive behaviour therapy by a psychiatrist or psychologist).

DISCUSSION

Levels of anxiety and depression reported in our large and representative cohort of women with ovarian cancer are lower than previously reported in this patient group. Earlier studies reported rates of clinical anxiety of 22%–29% and rates of clinical depression of 17%–21%, compared with our findings of 15% for clinical anxiety and 5.9% for clinical depression (although the latter figure is double the rate for community norms[23]).

Our finding of lower rates of anxiety and depression compared with previous studies may be because we had a more representative, population-based sample in our study. However, given our 66% response rate, it is possible that non-responders were more anxious or depressed. Alternatively, improved recognition of mental health problems in the general community may be in part responsible for the lower rates of anxiety and depression among our participants. In this sample, 49% of patients with clinical levels of anxiety or depression acknowledged a mental health problem, and 69% of these patients (33% of patients with clinical anxiety or depression) reported receiving specialist mental health treatment in addition to other support services. This is a higher uptake of mental and supportive services than the 25% suggested by earlier studies,[15] and is an encouraging trend.

Somewhat surprisingly, among demographic, disease and treatment variables, only symptom burden was associated with anxiety and depression in our sample. This contrasts with our expectation that patients receiving active treatment and those with advanced stage disease would report higher levels of distress.[24] One explanation may be the nature of ovarian cancer, with most women diagnosed with advanced-stage disease and a high rate of disease progression, potentially making symptom burden the most distinguishing clinical factor among women.

While current mental health treatment is a marker for current anxiety or depression, it may also reflect the success of ongoing mental health treatment in reducing symptoms of anxiety or depression, and it is therefore important to consider current mental health treatment as a potential predictor. Unsurprisingly, patients receiving mental health treatment were more likely to have elevated anxiety and depression. Among other predictors, lower social support predicted higher anxiety, and lower optimism was associated with both anxiety and depression; this is consistent with previous findings.[25] These findings suggest potential avenues for intervention targeting the increased use of social support groups and coping styles that promote optimism.

With respect to place of residence, our data are somewhat encouraging. Contrary to expectation,[26] we found no differences between patients living in major cities and those in regional/remote locations in terms of the prevalence of anxiety and depression, or the proportion of patients using specialist mental health treatment or support services, although there were some differences in the profile of the types of support services used. Given the growing awareness of the needs of patients in regional/remote areas,[27] and the increase in use of telecounselling, support groups, and online services, the divide between city and regional/remote patients may no longer be as great as it was in the past.

The situation of caregivers is less encouraging. Over 42% of caregivers reported elevated anxiety, with 19% scoring within the clinical range. Almost 19% of caregivers also reported elevated levels of depression, with 5% scoring within the clinical range. These levels of caregiver anxiety and depression are significantly higher than community norms. Furthermore, caregivers in our study were significantly more anxious than patients, while caregiver and patient depression levels were similar, consistent in part with previous findings.[27] We acknowledge the limitation of caregiver participation in this study (less than half that of patients). It is difficult to estimate how representative our findings are, given that our access to caregivers was dependent on the patients. One of the difficulties in assessing caregivers, and in helping caregivers access appropriate services, is that although they are closely involved in the cancer journey, they are not a primary focus of health services. It is also a limitation of our study that we did not ask caregivers about mental health difficulties and treatment, or the use of other support services.

Predictors of caregiver anxiety and depression included lower social support and lower optimism, consistent with both previous studies[6] and the findings for patients. This reinforces the need for support groups to welcome or provide exclusive support to caregivers as well as patients. Because of our patient population, our caregivers were primarily older male spouses, which meant that associations with age and sex could not be explored. Of note, patient distress was not a predictor of caregiver anxiety or depression, and this is also consistent with previous studies.[6] Thus, we cannot assume that the caregivers of patients who are distressed will also be the ones in most need, so caregivers need to be assessed independently of the patient.

In summary, this is the first representative, population-based study of patients with ovarian cancer and their caregivers documenting psychological morbidity and factors associated with morbidity. While rates of depression are still significantly above norms for patients, they are lower than those reported in previous studies. The situation of caregivers remains a concern.

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COMPETING INTERESTS

None identified.

AUTHOR DETAILS

Melanie A Price, BSc(Hons), PhD, Senior Research Fellow,[1] and Executive Director[2]
Phyllis N Butow, MClinPsych, MPH, PhD, Professor and Co-Director[1]
Daniel S J Costa, BSc(Hons), PhD, Research Associate[2]
Madeleine T King, BSc(Hons), GradDip(Med Stats), PhD, Cancer Australia Chair in Cancer Quality of Life[2]
Lynley J Aldridge, BPsych(Hons), Project Co-ordinator[2]
Joanna E Fardell, BSc(Hons), Research Assistant[1]
Anna DeFazio, BSc(Hons), PhD, Clinical Senior Lecturer,[3] and Head[4]
Penelope M Webb, BA(Hons), MA, DPhil, Senior Research Fellow[5]
Australian Ovarian Cancer Study Group
Australian Ovarian Cancer Study Group Quality of Life Study Investigators

1 Centre for Medical Psychology and Evidence-based Decision-making, School of Psychology, University of Sydney, Sydney, NSW.
2 Psycho-Oncology Co-operative Research Group, University of Sydney, Sydney, NSW.
3 Department of Obstetrics and Gynaecology, University of Sydney, Sydney, NSW.
4 Gynaecological Oncology Research Group, Westmead Institute for Cancer Research, Westmead Hospital, Sydney, NSW.
5 Genetics and Population Health Division, Queensland Institute of Medical Research, Brisbane, QLD.

Correspondence:
melanie.price@sydney.edu.au

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