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Socioeconomic disparities in psychosocial wellbeing in cancer patients

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ABSTRACT

This study tested the hypothesis that cancer patients from lower socioeconomic status (SES) backgrounds have poorer adjustment to cancer. In a longitudinal study of 352 patients with breast, prostate or colorectal cancer, SES was indexed as a composite of educational level, car and home ownership. Patients were classified as higher (3 markers: car, home and higher education) or lower (up to 2 markers) SES. Patients completed measures of depression, anxiety, quality-of-life, social difficulties and benefit-finding at 2 months (Time 1) and 10 months (Time 2) after diagnosis. Data on disease stage, treatment and co-morbid illness were also collected. At Time 1, lower SES patients were more anxious and depressed and had worse quality-of-life and more social difficulties. Psychological wellbeing improved on all measures by follow-up, and although not significant, the trend was towards diminishing, rather than increasing, differences in wellbeing between higher and lower SES groups. Acute psychosocial reactions to a cancer diagnosis appeared to be greater amongst patients with fewer educational and material resources, but longer-term adjustment did not appear to be any worse in lower SES patients.

1. Introduction

In recent years, we have seen increases in cancer incidence and decreases in cancer mortality, resulting in a rising number of people living with cancer.[1] The longer-term psychological wellbeing of cancer survivors is, therefore, becoming an important issue for modern cancer medicine.[2] Identifying higher risk sub-groups and putting services in place to meet psychosocial as well as medical needs are important aspects of cancer care. People from lower socioeconomic status (SES) backgrounds may have fewer psychological resources to mobilise in the face of a cancer diagnosis. Lower SES is consistently associated with greater financial, work and domestic strain[3,4] and lower social support and personal control.[5] It is also associated with poorer mental health in the general population.[6,7] Given these relationships, the added stress of a cancer diagnosis could be predicted to have a more adverse impact in patients from lower SES backgrounds.

The empirical literature on SES and psychosocial outcomes in cancer has produced inconsistent results. Some cross-sectional studies have reported lower wellbeing in patients from lower SES backgrounds,[8–11] but others have found varied effects across sub-groups. In studies of breast cancer patients, differences in wellbeing between higher and lower SES groups were found amongst older but not younger women in one study,[12] and in women receiving chemotherapy but not others, in another.[13] In a mixed case series, different associations with SES were found at different disease stages[14]: amongst patients who were 'survivors' (disease-free >2 years) or had locally recurrent disease, those from deprived backgrounds reported more social difficulties than those from affluent backgrounds, but in patients who had primary local

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disease, advanced disease or had been disease-free for >2 years, there were no significant SES differences.

Three longitudinal studies have tried to clarify the situation by assessing whether differences in wellbeing between higher and lower SES groups diminish or increase over the months following a cancer diagnosis. One British study of 122 younger women with breast cancer found no social class differences in psychiatric outcomes three months after mastectomy, but 12 months later the lower SES women had higher rates of psychiatric illness,[15] although there was no specific analysis of social class differences in time trends. Another longitudinal study of 860 American men with prostate cancer[16] found differences in quality-of-life by income, but not education or health insurance coverage, 6 months post-diagnosis. Neither income nor education predicted quality-of-life at subsequent follow-ups, although lack of health insurance coverage predicted poorer quality-of-life. A recent study in the Netherlands[17] investigated a small sample of mixed-site cancer patients ($n = 99$), for whom pre-diagnostic information was available because they had been enrolled in a cohort study. Individuals with more education had better emotional and physical wellbeing before their cancer diagnosis, but differences in emotional wellbeing disappeared at 2, 6 and 12 months post-diagnosis. The only significant differences between higher and lower SES groups were in physical functioning, which was worse for patients with less education at 2 and 6 months, but not at 12 months.

No clear picture of the impact of SES on psychosocial adjustment to cancer has emerged from the longitudinal studies, but gender, cancer site or health-care access could play a role. In (male) prostate patients treated in the US healthcare system, income appeared to moderate adjustment in the acute post-diagnostic phase but not longer-term,[16,17] although insurance coverage was a predictor of longer-term wellbeing possibly indicating differential access to extra supportive care during treatment. In women with breast cancer treated in the British National Health Service, where access to care is equal, SES was not associated with psychiatric illness in the acute phase, but was in the longer-term.[15] The one longitudinal study that included both sexes and a variety of cancer diagnoses was carried out in the Netherlands.[17] In the Netherlands everyone has private health insurance, and low income groups are subsidised by the government, but those on a higher income are still able to pay for extra services. In this context, pre-diagnostic SES differences in emotional wellbeing were no longer apparent after diagnosis, but the small sample size gave limited statistical power to detect differences.

There is a need for a larger-scale, longitudinal study in a mixed-sex, mixed-diagnosis sample in a system where health insurance and income are not barriers to services. The present study, therefore, examined longitudinal associations between SES and psychosocial outcomes in a large sample of patients being treated in hospitals in the South of England for breast, prostate or colorectal cancer.

2. Patients and methods

2.1. *Patients*

Breast, prostate and colorectal cancer patients ($n = 352$) were recruited by research nurses in nine hospitals in London, Middlesex and Essex over a two-year period (February 2003–January 2005). Patients presenting with severely advanced disease were excluded because of the longitudinal nature of the study. Precise estimates of participation rates were difficult to obtain because not all hospitals maintained records of whether patients were invited to participate, but in the two hospital sites that recorded this information, 187 patients were invited to participate in the study and 125 agreed; giving a response rate of 67%.

Data were collected at two time points: first at 1–3 months post-diagnosis (Time 1) ($M = 66$ days, $SD = 45$ days) and again 10–13 months post-diagnosis (Time 2) ($M = 362$ days, $SD = 45$ days). Fourteen patients were excluded from the second round of data collection; 8 because they were too ill or did not wish to continue and 6 patients had died. Other patients ($n = 338$) were sent the follow-up questionnaire, and 279 (82.5%) completed it.

2.2. *Design and procedure*

Patients with a new diagnosis seen at the participating hospitals were given a questionnaire pack with an information sheet and consent form. Questionnaires were returned to the research team via freepost mail and participants provided an address for the follow-up. Hospital staff organised a second mailing for non-responders after one month. Consent was sought from each patient to access their medical records. Ethical approval was obtained from the London Multi-centre Research Ethics Committee.

2.3. *Measures*

2.3.1. *Socioeconomic status*

SES was indexed with items reflecting material circumstances and education: car-ownership or not (score 1/0) home-ownership or not (score 1/0), and some higher education versus none (score 1/0). Measures like this have been used in other research studies (e.g. Ref. 18). The three indices were combined to give a two category marker of SES: higher (no markers of deprivation; $n = 141$) and lower (1–3 markers of deprivation; $n = 195$).

2.3.2. *Medical characteristics*

Information on disease stage, treatments and co-morbid disease was obtained from medical records for 282/352 (80%) patients, but lack of hospital staff time precluded this for the other patients. In these cases, self-report items from the survey regarding disease stage (‘Has your cancer spread to any other part of your body?) and treatment (‘Have you already received any of the following treatments?’) were used, but there was no question on co-morbidity. An analysis comparing objective disease stage with the self-report indicator showed a relatively high level of accuracy with 78% correctly classifying that their disease was not invasive and 70% correctly classifying their disease as invasive. The pattern of results when excluding the cases that use self-report was similar to that when these cases were included. However, excluding these cases did lead to reduced power and increased the likelihood of Type 1 error. Therefore, the cases where self-report information was available were included.

We classified patients into two disease stage groups: 'non-invasive' disease and 'invasive' disease (lymph node involvement or distant metastases). There were four main treatments: surgery, radiotherapy, chemotherapy and hormone therapy. Co-morbid illness ('present' versus 'absent') was also noted.

2.3.3. *Psychosocial wellbeing*

2.3.3.1. *Quality-of-life*. Quality-of-life was assessed using the four subscales of the Functional Assessment of Cancer Therapy (FACT-G)[19]: physical (7 items) functional (7 items), social/family (7 items) and emotional wellbeing (6 items). Respondents indicate how true each statement is for them during the past seven days using five response options ('not at all' to 'very much'). Scores ranged from 0 to 24 for the 6-item scale and 0 to 28 for the 7-item scales, with higher scores indicating better quality-of-life. Total scores (sum of the 4 subscales) ranged from 0 to 108. Minimally important differences in the quality-of-life scores were defined as the 'smallest difference in score in the domain of interest that patients perceive as important, either beneficial or harmful, and that would lead the clinician to consider a change in the patient's management' (p. 377).[20] A change between 2 and 3 points on the subscales and 3–7 points for the total score has been estimated as the minimally important differences on the FACT scales.[21]

2.3.3.2. *Anxiety*. Anxiety was assessed with the Hospital Anxiety and Depression Scale anxiety scale (HADS-A;[22]). This is a 7-item scale and ratings refer to the past week. Summed scores form a scale ranging from 0 to 21, with higher scores indicating more anxiety. A threshold of $\geqslant 8$ was used to indicate possible anxiety disorder.[23]

2.3.3.3. *Depression*. Depression was measured with the Centre for Epidemiological Studies Depression Scale (CES-D;[24]). The 10-item version[25] was used, but with the original response options. Ratings refer to the past week. Summed scores ranged from 0 to 30 with higher scores indicating more depression. A cut-off score of $\geqslant 25$ on the full 20-item scale has been used to indicate probable major depressive disorder,[26] so a pro-data cut-off of $\geqslant 13$ was used for the shortened scale in this study.

2.3.3.4. *Social difficulties*. The Social Difficulties Inventory (SDI)[27] is a 21-item questionnaire for use in oncology care, covering problems in, e.g. personal care, domestic chores, finances, relationships, body image and leisure activities. Respondents rate difficulties over the past month. The range is 0–63 with higher scores indicating more social problems.

2.3.3.5. *Benefit finding*. This assesses benefits that are perceived to arise from the experience of cancer (e.g. become a stronger person), and was originally developed for breast cancer patients.[28] In full it is a 17-item scale, but we used an 11-item version, which had good internal reliability ($\alpha = 0.95$). Scores ranged from 11 to 55 with higher scores indicating increased benefit finding.

2.4. *Statistical analyses*

Data were analysed using analysis of covariance with SES group as the independent variable, and age, gender, disease site, disease stage and treatment as control variables. Outcomes were quality-of-life, social difficulties, anxiety, depression and benefit finding. Changes in psychosocial wellbeing were analysed using repeated measures analyses. The effect of clustering by hospital was considered and intra-cluster correlation coefficients were calculated for all the dependent variables. Most had small intra-cluster correlations (range: 0.02–0.04); only the social difficulties' variable indicated a medium effect (0.1).[29] Analyses involving this variable were adjusted for clustering.

3. Results

3.1. *Characteristics of the respondents*

Nine hospitals took part in the study, between them recruiting 352 patients. More women (68%) than men (32%) participated, largely because of the high proportion of breast cancer patients (204/352, 58%). Ages ranged from 29 to 89 years, with 52% over 65. Patients were predominantly white (85%) and married (69%).

Table 1 shows the medical characteristics of the patients. A third had lymph node involvement or distant metastases (33%), the majority had received surgery (81%), half had been given radiotherapy (47%), and a third received chemotherapy (34%). Most (60%) breast and prostate cancer patients were continuing with some form of hormone therapy. Almost half had at least one co-morbid condition (45%), but information on co-morbidity was only available for 275 patients.

3.2. *Psychosocial wellbeing*

In terms of emotional distress, 31% ($n = 97$) of the sample was categorised as highly anxious and 11% ($n = 40$) as highly depressed using the established 'cut-off' scores, at Time 1. The other wellbeing variables were not designed to categorise patients in this way.

Age and gender were associated with a number of psychosocial wellbeing outcomes, but even after controlling for them, cancer site still appeared to be related to wellbeing, with prostate cancer patients reporting better functional quality-of-life ($F[2,345] = 5.06$, $p < 0.01$) and fewer social difficulties ($F[2,306] = 4.47$, $p < 0.05$) than either breast or colorectal patients.

Patients with invasive disease reported more depression ($F[1,298] = 5.13$, $p < 0.05$) and social difficulties ($F[1,287] = 15.25$, $p < 0.001$), and poorer quality-of-life (physical $[1,319] = 5.73$, $P < 0.05$, emotional: $F[1,322] = 5.81$, $p < 0.05$, functional: $F[1,320] = 6.72$, $p < 0.05$, total: $F[1,316] = 4.79$, $p < 0.05$) than those with non-invasive disease. Undergoing treatment also affected wellbeing. Chemotherapy treatment was associated with lower quality-of-life (emotional: $F[1,339] = 13.83$, $p < 0.001$, functional: $F[1,338] = 9.65$, $p < 0.01$, physical: $F[1,337] = 18.07$, $p < 0.001$, total: $F[1,333] = 12.31$, $p < 0.01$) and more social difficulties ($F[1,300] = 28.54$, $p < 0.001$). Surgery and radiotherapy also had some impact on wellbeing

Table 1 – Medical characteristics

Medical	SES Group			
	Lower ($n = 195$)		Higher ($n = 141$)	
	N	%	N	%
Cancer site				
Breast	116	59.5	85	59.8
Colorectal	43	22.1	35	24.8
Prostate	36	18.5	21	14.9
Disease stage				
Invasive	113	57.9	89	63.1
Non-invasive	65	33.3	48	34.0
Missing	17	8.7	4	2.8
Treatments received				
Surgery				
Yes	158	81.0	119	84.4
No	32	16.4	19	13.5
Missing	5	2.6	3	2.1
Chemotherapy				
Yes	65	33.3	50	35.5
No	127	65.1	89	63.1
Missing	3	1.6	2	1.4
Radiotherapy				
Yes	87	44.6	77	54.6
No	105	53.8	62	44.0
Missing	3	1.6	2	1.4
Hormone therapy				
Yes	93	61.2	64	60.4
No	58	38.2	40	37.7
Missing	1	0.7	2	1.9
Co-morbid illness				
Yes	100	51.3	52	36.9
No	54	27.7	58	41.1
Missing	41	21.0	31	22.0

(surgery: lower functional ($F[1,335] = 4.83$, $p < 0.05$) and physical ($F[1,334] = 5.48$, $p < 0.05$) quality-of-life and increased social difficulties ($F[1,298] = 6.06$, $p < 0.01$), radiotherapy: lower emotional quality-of-life ($F[1,339] = 4.29$, $p < 0.05$) and increased depression ($F[1,313] = 3.93$, $p < 0.05$)). Neither the presence of a co-morbid illness nor the length of time between diagnosis and completing the first survey was related to wellbeing.

The indicators of SES showed that 55% of the sample had educational qualifications, 79% were car owners and 80% were home owners. Composite markers created two groups: lower SES ($n = 195$) and higher SES ($n = 141$). There were no differences in SES distribution by hospital, gender, disease site, disease stage or types of treatment, but lower SES patients were older ($F[1,334] = 8.55$, $p < 0.01$). More (65%) low SES participants had a co-morbid illness than high SES participants (47%) ($\chi^2 = 8.20$, df = 1, $p < 0.01$).

Table 2 shows the relationship between SES and psychosocial wellbeing at Time 1. Lower SES patients had worse social/family ($F[1,307] = 5.67$, $p < 0.05$) and overall quality-of-life ($F[1,303] = 4.91$, $p < 0.05$), higher anxiety ($F[1,305] = 5.53$, $p < 0.05$) and depression ($F[1,289] = 4.76$, $p < 0.05$) and more social difficulties ($F[7,298] = 16.32$, $p < 0.01$). These differences persisted after controlling for age, gender, site, stage and treatment. Using the 'cut-off' scores for depression and anxiety, lower SES patients were more likely to be depressed or anxious respectively: odds ratio (OR) = 2.16, confidence interval (CI) = 1.01–4.61, $p < 0.05$ and OR = 2.59, CI = 1.49–4.51, $p < 0.001$ (controlling for age, gender, cancer site, disease stage and treatment).

3.3. *Longitudinal analyses*

279 of a possible 338 patients (82%) completed the second survey. There were no differences between responders and non-responders in age, gender, disease site or disease stage. Lower SES patients were more likely to be non-responders (25%) than higher SES patients (12%) ($\chi^2 = 8.86$, df = 1, $p < 0.01$). Overall, responders had reported better quality-of-life (physical: $F[1,343] = 6.36$, $p < 0.05$, social/family: $F[1,343] = 4.04$, $p < 0.05$, total: $F[1,340] = 6.75$, $p < 0.01$), fewer social difficulties ($F[1,304] = 4.04$, $p < 0.05$), and lower levels of anxiety ($F[1,340] = 5.86$, $P < 0.05$) and depression ($F[1,318] = 6.51$, $p < 0.01$) at Time 1, but a sub-group analysis showed that there were no differences in wellbeing between the low SES responders and non-responders.

Change in psychosocial wellbeing from Times 1 to 2 was assessed with repeated measures ANOVAs and the results

Table 2 – Psychosocial wellbeing by SES at Time 1 (immediately post-diagnosis) and Time 2 (follow-up), controlling for age, gender, cancer site, disease stage and chemotherapy treatment (Mean with 95% confidence intervals)

Psychosocial wellbeing	Time 1			Time 2		
	SES group		P	SES group		P
	Lower $n = 195$	Higher = 141		Lower $n = 195$	Higher $n = 141$	
Quality-of-life (FACT)						
Physical	22.0 (21.0–23.0)	22.7 (21.5–23.8)	0.426	23.7 (22.4–24.9)	23.8 (22.6–25.0)	0.922
Social/family	20.8 (19.6–22.0)	23.0 (21.6–24.3)	0.018	20.6 (19.1–22.1)	22.0 (20.5–23.4)	0.899
Emotional	17.7 (16.7–18.7)	18.3 (17.2–19.5)	0.227	19.5 (18.3–20.7)	19.8 (18.6–20.9)	0.959
Functional	17.1 (15.8–18.5)	17.4 (15.8–19.0)	0.123	20.3 (18.8–21.8)	20.9 (19.4–22.4)	0.236
Total	77.7 (74.4–80.9)	81.3 (77.6–85.1)	0.028	84.0 (79.8–88.2)	86.4 (82.4–90.4)	0.599
Social difficulties (SDI)	10.2 (9.0–11.4)	8.0 (6.8–9.3)	0.005	8.2 (5.4–11.0)	6.0 (3.5–8.5)	0.254
Anxiety (HADS)	6.3 (5.4–7.3)	4.6 (3.4–5.7)	0.019	4.7 (3.6–5.8)	4.0 (2.9–5.2)	0.407
Depression (CES-D)	7.5 (6.2–8.7)	5.2 (3.7–6.7)	0.030	6.0 (4.4–7.5)	5.9 (4.5–7.3)	0.518
Benefit finding	32.3 (33.5–39.1)	35.0 (31.8–38.3)	0.133	34.9 (31.5–38.3)	34.7 (31.4–38.0)	0.799

are shown in Table 3. Overall there were improvements in quality-of-life (physical $F[1,261] = 11.78$, $p < 0.001$; emotional $F[1,264] = 26.77$, $P < 0.001$; functional $F[1,261] = 39.30$, $p < 0.001$; total $F[1,256] = 20.70$, $p < 0.001$), and a decrease in social difficulties ($F[1,213] = 28.27$, $p < 0.001$). There was also a slight reduction in reported social/family quality-of-life ($F[1,260] = 4.39$, $p < 0.05$). Only changes in functional and overall quality-of-life scores met the criteria for minimally important differences. Minimally important difference scores or cut-off scores for the social difficulties inventory are not available.

There were no interactions between SES and changes in psychosocial wellbeing over time, although differences in psychosocial wellbeing between higher and lower SES groups appeared to be narrowing and were no longer significant at Time 2 (see Table 2). Fig. 1 shows the relationship between SES and anxiety to illustrate the relationships.

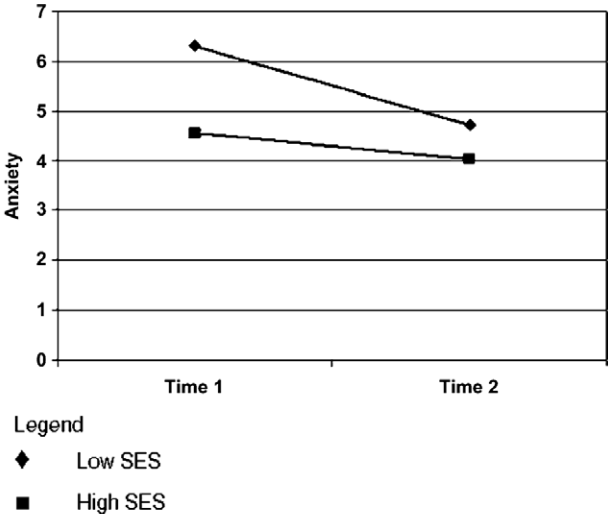

Fig. 1 – Relationship between SES and anxiety.

4. Discussion

This study explored the relationship between SES and psychosocial wellbeing in patients with breast, colorectal or prostate cancer. Immediately after diagnosis, patients from higher SES backgrounds appeared to fare relatively better on anxiety, depression, quality-of-life and social difficulties. The SES differences in depression and anxiety between higher and lower SES groups appeared to be greater than those observed in healthy populations of older adults.[7,30] A meta-analysis of population-based studies found that the odds ratio for depression in lower versus higher SES groups was 1.81[7] which compares with an OR of 2.61 in this patient population. This suggests that a cancer diagnosis may acutely increase disparities in emotional distress.

However, over the 10 months of follow-up, and in the context of a significant overall improvement in wellbeing in both groups, the pattern of results suggested that lower SES patients made the greatest gains. SES differences in wellbeing between higher and lower SES groups were no longer statistically significant at follow-up, although interactions between SES and change over time were not significant. These results give no support to the idea that SES differences in wellbeing between higher and lower SES groups are increased in the longer-term by a diagnosis of cancer. In fact, if anything, SES disparities in wellbeing in cancer survivors are lower than those typically reported in population samples. The reasons behind the change in association between the higher and lower SES groups and psychosocial wellbeing from disparity to equality are not clear and mechanisms were not explored in this study. However, it is possible that whilst a cancer diagnosis can exacerbate disparities in wellbeing between higher and lower SES groups in the early days, the experience of treatment and the associated supportive care environment supports all patients well regardless of SES background, leading to a decrease in the differences in wellbeing between SES groups. Further research could usefully explore the underlying mechanisms.

The results of this study are consistent with two other studies that found an association between SES indicators and poorer quality-of-life immediately after diagnosis, with a lack of association at follow-up.[16,17] They appear inconsistent with the finding of poorer wellbeing in lower SES breast patients at 12-months after surgery[15] and in disease-free survivors.[14] However, the present results do not necessarily preclude the possibility that SES differences in wellbeing between higher and lower SES groups could re-emerge amongst longer-term survivors whose psychological profiles may become similar to population-based samples once active treatment is finished.

Table 3 – Repeated measures analyses showing change in psychosocial wellbeing from Time 1 (immediately post-diagnosis) to Time 2 (follow-up) (Mean with 95% confidence intervals)

	Time 1		Time 2		P
Quality-of-life (FACT)					
Physical	22.8	(22.3–23.3)	23.7	(23.2–24.2)	0.001
Social/family	22.6	(22.0–23.2)	21.9	(21.3–22.6)	0.037
Emotional	18.0	(17.4–18.5)	19.2	(18.7–19.8)	<0.001
Functional	18.5	(17.8–19.3)	20.9	(20.2–21.5)	<0.001
Total	82.0	(80.2–83.7)	85.7	(83.9–87.4)	<0.001
Social difficulties (SDI)	7.9	(6.9–8.9)	5.5	(4.6–6.5)	<0.001
Anxiety (HADS)	5.2	(4.7–5.8)	5.0	(4.5–5.5)	0.312
Depression (CES-D)	5.9	(5.3–6.5)	5.9	(5.3–6.6)	0.969
Benefit finding	35.3	(33.8–36.8)	36.1	(34.6–37.5)	0.203

There were a number of limitations to this study. The recruitment strategy may have introduced bias because nurses were responsible for recruiting and were therefore ‘gatekeepers’. Home owners (80%) were slightly over-represented compared to national figures (69%).[31] Lower SES participants were slightly less likely to complete the follow-up assessment, which is a common problem in longitudinal research. Participants who failed to complete the follow-up assessment had worse psychosocial wellbeing at Time 1. However, despite these issues, there was good spread of SES and wellbeing at both times. There was no difference between the low SES responders and non-responders in terms of wellbeing and therefore it is unlikely that the differences in non-response by SES contributed to the more limited differences in wellbeing between SES groups seen at Time 2 compared to Time 1.

The results of this study suggest that greater social and economic resources confer only limited – if any – advantage in terms of psychosocial adjustment to cancer diagnosis and treatment. Although wellbeing was better immediately after diagnosis in higher SES patients, this was not reflected in better adjustment over time. The heterogeneity in research findings suggests that associations between SES and wellbeing in cancer patients may depend on particular circumstances, rather than being a general effect across all cases and all cancers. We can therefore conclude tentatively that whilst all cancer survivors deserve the best possible psychosocial care, lower SES patients do not specifically represent a higher-risk group for poor psychosocial adjustment in the first year after diagnosis.

Conflict of interest statement

None declared.

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