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ILLUSIONS IN ADVANCED CANCER: THE EFFECT OF BELIEF SYSTEMS AND ATTITUDES ON QUALITY OF LIFE

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Abstract: *Patients with advanced cancer frequently express positive attitudes and can be unduly optimistic about the potential benefits of treatment. In order to evaluate an illusory domain in the context of advanced cancer, we developed a scale of will to live and characterized the beliefs that patients held about the curability of their cancer, and how committed they were to using alternative treatments. A measure of quality of life was used as the dependent variable in order to assess the association between these attributes. After a preliminary exploration confirmed the presence of an illusory domain, these concepts were prospectively tested in 149 ambulant patients with advanced cancer who attended for palliative systemic treatment, radiation treatment or supportive care. The scale of global quality of life was reliable (Cronbach's alpha coefficient 0.72). The distribution of the scores of will to live was skewed, with no respondent scoring poorly, and the scale was reliable (Cronbach's alpha coefficient 0.82). The scale of belief in curability showed diverse beliefs. In some cases, there was a discrepancy between respondents' beliefs in curability and what they believed to be the report by their doctors. There was also an association between a committed use of alternative treatments and a belief in the curability of the cancer (p50.001). In a multiple regression analysis, both will to live and performance status remained associated with better quality of life scores after adjustment for other relevant variables (p50.05 and 50.001, respectively). These results suggest that positive illusory beliefs can be measured and are an important component of adaption for some patients with advanced cancer. Furthermore, this illusory domain may influence the perception and measurement of quality of life.*

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INTRODUCTION

What do patients with advanced cancer believe about their prognosis and how do they respond? In psychosocial research, studies of healthy people recognize that positive illusory beliefs may contribute to satisfaction with life (Taylor and Brown, 1988). Since some patients with advanced cancer express optimistic views in the face of declining health and a limited lifespan, illusory attitudes towards their illness and beliefs about the outcome of treatments could influence their perception of quality of life. To date, there has been little evaluation of the consequences of illusory beliefs in patients with advanced cancer and none about their impact on the perception of

quality of life. Numerous scales of quality of life have been developed and refined over the last two decades, and the measurement of quality of life is now regarded as an important end-point of clinical trials evaluating the efficacy of treatments for cancer (Moinpour et al., 1989; Aaronson et al.,

1993; Slevin et al., 1988). The historical foundation of scale development has emphasized measures of symptoms, functional capacity, psychological and emotional health, and social activity (Najman and Levine, 1981; Donovan et al., 1989) but, in cancer clinical trials, quality of life is typically conceptualized in terms of functional activity and the status of symptoms (Aaronson et al., 1993; Cella et al., 1993), with an evolving focus on the development of disease and treatment specific subscales (Bjordal et al., 1994; List et al., 1996). However, quality of life is a multidimensional construct that goes beyond the impact of a cancer and its treatment on symptoms and functional status, and is best viewed as a subjective evaluation of life as a whole and a comparison with what is ideal or possible (De Haes, 1988; Cella and Cherin, 1988). This global view of quality of life implies a perceived satisfaction with life in comparison with healthy people and in terms of future expectations. Such an interpretation acknowledges a potential contribution of positive illusions to the perception of quality of life and challenges the inference of a causal relationship between improvements of symptomatic and functional activity scores with global quality of life measures.

The objectives of this study were the exploration and characterization of an illusory domain of thought and action in patients with advanced cancer, and an evaluation of the relationship between this illusory domain and quality of life. In order to determine the feasibility of characterizing illusory concepts, this study was divided into two phases. The first phase explored concepts of global quality of life conceptualized in terms of happiness and satisfaction, and evaluated the domains of depression, social experiences and function as well as measures of symptoms. A qualitative and quantitative analysis also explored the concept of will to live and the use of alternatives to conventional medical treatment. In the second phase, these concepts were prospectively tested in patients with advanced cancer who were in reasonably good general condition and therefore judged as not being in an immediately terminal phase of their illness (Yates et al., 1993). These patients were potential candidates for active treatment of their cancer and could gain palliative benefit from a response, but not cure. As a result, these patients were in a position to hold and express positive illusions about the benefits of treatment.

FIRST PHASE OF STUDY } EXPLORATION OF CONCEPTS METHODS

The primary goal of the first phase of the study was to identify, qualitatively and quantitatively, valid and reliable measures of the conceptual domains of quality of life, and patient beliefs and attitudes about the diagnosis and experience of cancer. A 143-item questionnaire was administered to 85 ambulant patients who attended the South Brisbane Oncology Research Unit, Princess Alexandra Hospital, and the Wesley Cancer Care Centre. All patients were informed of the purpose of this study and written informed consent was provided in accordance with

the Ethics Committees of the respective institutions. Participants of this study were being treated with palliative or curative intent. Based on the conceptual model of Ware (1984) for assessing the impact of a disease on quality of life, a questionnaire was developed to reflect the conceptually distinct facets of physical, psychological and social life affected by cancer and its treatment. The questionnaire included scales to evaluate physical symptoms, depression and social experiences, networks and functions. Scales of attitudes to, and satisfaction with, treatments were also developed on the basis of the clinical experience of the oncologists involved in this study. In addition, general attitudinal questions examined the impact of a personal experience of cancer. This included 40 items which assessed patients' beliefs about the future, their feelings and experiences. Scales of global quality of life (Bradburn, 1969; Campbell et al., 1976; Coates et al., 1976; de Haes and Van Knippenberg, 1985;

Ferrans, 1990) and depression (Bedford and Foulds, 1977) were derived from the literature and adapted to emphasize an evaluation of the concept of quality of life in terms of satisfaction with life and a sense of well being as a whole, rather than published measures that emphasized morbidity and functional status. A series of factor analyses and correlational analyses of all items comprising the various beliefs, attitudes, experiences and quality of life were then undertaken to facilitate the development of multi-item scales that measured the concepts of interest (Carmines and Zeller, 1979). Cronbach's alpha coefficients were calculated to assess the internal consistency of the identified scales (Cronbach, 1951). In addition,

Table 1. Psychometric properties of the scales of quality of life, will to live, health related measures and the use of alternative treatments

Concept	Scale development		Cronbach's alpha coefficient
	Items	Likert range	
Global quality of life	5	4	0.79
Quality of life domains			
Physical symptoms	7	4	0.79
Depression	7	6	0.73
Social experiences			
Positive	12	4	0.61
Negative	12	4	0.67
Function	5	3	0.76
Network	5	6	0.83
Attitudes and beliefs			
Will to live	13	5	0.84
Alternative treatments	10	5	0.84
Confidence in treatments	6	5	0.73

all participants were interviewed in depth after completing the questionnaire to assess the face and content validity of the items.

RESULTS

Eleven scales were developed from the database of the pilot questionnaire utilizing factor analysis and reliability testing. Seven scales assessed the various physical, psychological and social domains that may be affected by cancer and its treatment. Three scales assessed various attitudes associated with the experience of cancer, and one scale assessed global quality of life. Table 1 summarizes the psychometric properties of the scales assessing physical symptoms, depression, social experiences, attitudes to alternative treatments, confidence in treatments, will to live and global quality of life. Detailed interviews of all participants followed completion of the questionnaire and the results suggested that a strongly held belief in curability and will to live, and a committed use of alternatives to conventional medical treatment clustered into an illusory domain. The final profile of the quantitative results and the subsequent qualitative assessment of the face and content validity of the scales provided confidence to test this illusory domain and its potential contribution to the perception of quality of life in a group of patients who were being treated with palliative intent.

SECOND PHASE OF STUDY DEVELOPMENT OF CONCEPTS METHODS

Design

The goals of the second phase were to apply the measures developed in the first phase of the study to patients with advanced cancer, and to expand concepts identified in the qualitative and quantitative assessment of the first study. The current report is concerned only with these previously developed scales and new measures that contributed to positive illusions and overall quality of life.

Ambulant patients attended the South Brisbane Oncology Research Unit, Princess Alexandra Hospital, and The Wesley Cancer Care Centre for palliative systemic treatment, radiation treatment or follow-up evaluation and supportive care. All patients attending these centres had been informed verbally about the extent of their cancer, its incurability, their limited life span, the palliative goal of treatment, the response to treatment and their overall progress prior to activation of this study. The plan was to prospectively identify and target all potentially eligible patients and to capture their immediate views about their cancer. To be eligible, patients had locally advanced or metastatic cancer, measurable or evaluable disease, an estimated survival between 3 months and 2 years, a performance status of ECOG 0-3, and a time interval since last review of less than 3 months.

Sample

During the 10-week period of this study, 178 consecutive patients potentially fulfilled the criteria for participation in this study. Four patients did not attend on the date of appointment. Sixteen patients refused to participate or declined to complete the questionnaire, and 6 patients were missed because of time constraints at the time of outpatient attendance. Three patients had an ECOG performance status of 4 at the time of administration of the questionnaire. The remaining 149 eligible patients formed the basis of this analysis.

TABLE 2

Table 2. Details of patients

	Number	(%)
<i>Sex</i>		
Male	55	36.9
Female	94	63.1
<i>Age</i>		
Range	28–84	
Median	57	
<i>Treatment</i>		
Chemotherapy	72	48.3
Radiotherapy	30	20.1
Endocrine	25	16.8
Combination	8	5.3
Observation	14	9.5
<i>Performance</i>		
<i>Status-ECOG</i>		
0	60	40.3
1	61	40.9
2	19	12.8
3	9	6.0
<i>Diagnosis</i>		
Breast	61	40.9
Bowel	29	19.5
Melanoma	18	12.1
Lung	8	5.4
Gastric	5	3.3
Other	28	18.8

Instruments

A 171-item self-administered questionnaire was designed to measure social, health and demographic factors, and to refine measures of the concepts developed from the first phase of the study. The demographic, health and treatment characteristics of the 149 respondents are set out in Table 2. A four item scale of quality of life, derived from the first phase of the study, was utilized as the dependent variable in the analyses of this study (Table 3). This scale incorporated a time frame which avoided measurement of immediate mood. Three items reflected a ‘generalized nowadays’ time frame, and an additional item looked at the

Table 3. Scales of quality of life, will to live and index of belief in curability

Quality of life scale

How satisfied are you with your life as a whole these days?

1. Very satisfied
2. Satisfied
3. Dissatisfied
4. Very dissatisfied

Taking things altogether, how would you say things are these days?

Would you say you are:

1. Very happy
2. Happy
3. Not too happy
4. Unhappy

Generally, do you feel you enjoy life:

1. All of the time
2. Most of the time
3. Some of the time
4. Never

How often do you experience feelings of unhappiness?

1. All of the time
2. Most of the time
3. Some of the time
4. Never

Cronbach's alpha = 0.72

Will to live scale:

I am going to beat this regardless

I am determined to beat this

I desperately want to live

I have a lot to live for

I will hang on to life at any cost

Cronbach's alpha = 0.82

Index of belief in curability

I believe that my cancer:

1. Is curable
2. Is not curable
3. Don't know

Regardless of what your doctors have told you, how long do you expect to survive?

1. My condition is curable
2. One year or more
3. Some months
4. Some weeks
5. No idea/don't know

My doctor says my cancer

1. Is curable
2. Is not curable
3. I am not certain what my doctor has told me about cure
4. My doctor has said nothing to me about cure

whole of life. Three measures were adapted from the first phase of the study to tap an illusory domain. The first measure comprised a five item version of the 13-item will to live scale developed in the first phase (Table 3). These five items were selected after factor analysis of the original 13-item scales suggested two possible sub-scales} an eight item series of statements indicating a willingness of patients to have treatment in order to survive a cancer, and a five-item scale which was more

representative of the core concept of will to live. The second measure included items measuring the respondents' beliefs about the curability of their cancer (Table 3). One item assessed respondents' recollections of what the doctor had told them about curability and two items assessed what the respondents themselves believed about curability. The latter two items were added to create an index of belief in curability. The third measure utilized a series of questions to examine the use of, and belief about, alternatives to conventional medical treatment. The development of these scales, which emphasized the degree of commitment of respondents to alternatives to conventional medical treatment, have been described elsewhere (Yates et al., 1993). To confirm the validity of the concepts detailed in this phase of the study, qualitative data were collected by the interviewers (PY and AC). Spontaneous comments by respondents were recorded in 91 cases by the interviewers and an additional 9 in-depth interviews were conducted after completion of the questionnaire. Physicians also completed an assessment at the time of administration of the questionnaire. This assessment included the diagnosis, performance status, the progress of symptoms since the last assessment and the objective response to chemotherapy and/or endocrine treatment. The time interval since the last patient assessment ranged from 3 weeks to 3 months. Physicians rated the progress of cancer related symptoms as being stable, better or worse since the last assessment. The measurement of objective response utilized standard WHO guidelines (World Health Organisation, 1979) and the interval since the last assessment of objective response was at least 6 weeks and no more than 3 months.

Data analysis

Data were entered and analyzed utilizing the statistical package SPSS for Windows. The interitem correlation within individual concepts was obtained with a Cronbach's alpha coefficient (Cronbach, 1951). A Kendall Taub was utilized to examine associations among items with ordered categories. A chi-square test was used to assess associations among categorical variables. Analysis of variance and multiple regression analyses of quality of life scores were used to test the association between the concepts of will to live, belief in curability and use of alternatives, with the quality of life as the outcome variable. Physician rated measures of performance score, status of symptoms and objective response to systemic treatment were also included as independent variables in the analysis of variance and the multivariate analysis of quality of life.

RESULTS

Each item on the quality of life scale had a score ranging from 1 (representing a measure of good quality of life) to 4 (a measure of poor quality of life). The Cronbach's alpha coefficient of this scale was 0.72 (Table 3), with the four item scale having a potential range of 4–16 and an actual range of 4–12. In the subsequent analysis, responses were categorized as mean quality of life and good quality of life, the latter representing the top tertile of scores (Table 6). On a scale of 1 (strongly agree) to 5 (strongly disagree), respondents were asked to indicate how well the statements about will to live reflected their own beliefs. The Cronbach's alpha coefficient for the will to live scale was 0.82 (Table 3). As in the first phase, there was a pronounced tendency for responses to agree with each statement, indicating that respondents differentiated between 'strongly agreeing' and 'agreeing'. A summated scale was created having a potential range of 5, which represented a strong will to

live, to 25, which represented a weak will to live. The actual responses ranged from 5 to 19 and over half the respondents scored 5 or 6. For the purpose of further analysis, respondents were categorized into three approximately equal groups according to their scores on this scale (Table 6). Scale scores of 5 were categorized as having a very strong will to live, scores 6–9 as having a strong will to live, and scores 10–19 as having a moderate will to live. Belief in curability was assessed by two items that asked respondents to indicate if they believed that their cancer was curable. The responses to the two questions were coded to create an index with a potential and actual range of 2 (strongly held belief in curability) to 6 (belief that cancer was not curable).

Table 4. Respondents' beliefs of curability and recollections of doctors' reports^a

Respondents' beliefs	Respondents' recollections of doctors' reports of curability			Total
	Curable	Uncertain	Incurable	
Curable	16	8	15	39 (27%)
Uncertain	12	25	24	61 (42%)
Incurable	0	8	37	45 (31%)

^aFour responses incomplete and Kendall Tau_b = 0.38, *p* < 0.001.

In the subsequent analysis, respondents were categorized into three groups based on their scores in these scales (Tables 4 and 6). These categories of belief in curability were designated as curable, uncertain and incurable.

Table 4 sets out respondents' beliefs about the curability of their cancer and their recollections of what doctors had told them about curability. Of the 145 evaluable responses to these questions, 39 respondents (27%) believed that their cancer was curable and 61 (42%) were uncertain. Only 45 respondents (31%) believed that their cancer was incurable. Of the 39 respondents who believed that their cancer was curable, 16 (41%) reported that their doctor had informed them of its curability but another 15 (38%) reported that the doctor had stated that their cancer was incurable.

In general, there was an association between the beliefs of the 106 respondents who were uncertain of their chance of cure or who regarded their cancer as incurable, and their recollections of what the doctor had stated. Of this group, only 12 patients (11%) believed that their doctor had stated that the cancer was curable.

In this study, 33 respondents were strongly committed to the use of alternative treatments in addition to conventional medical care. Since the promoted goal of many alternative treatments is cure, belief in curability was assessed according to the use of alternative treatments. The results in Table 5 show that committed users were more likely to believe that their cancers were curable than those respondents who did not use alternative treatments or who made only minimal changes to their lifestyle (*p* < 0.001).

Table 5. Committed use of alternative treatments and the distribution of belief in curability

	Committed use (n=33) %	No/minimal use (n=116) %
Belief in curability ^a		
Curable	51.52	18.58
Uncertain	30.30	46.90
Incurable	18.18	34.51

^aThree items incomplete and $\chi^2(2) = 13.73$, $p < 0.001$.

In order to explore the relationship between belief in curability, use of alternatives to conventional medical treatment and will to live, bivariate and multivariate analyses were conducted using quality of life as the reference construct. These analyses also included objective physician-rated measures known to be associated with measures of quality of life.

Table 6 shows an analysis of variance of mean quality of life scores, and a chi-square analysis of the top tertile scores of quality of life for these objective measures and tested concepts. For the purpose of this analysis, patients with an ECOG performance status of 2 and 3 were pooled. There was a strong association between performance status and mean and top tertile quality of life scores. Objective response was determined by physicians in the 105 evaluable patients who were treated with cytotoxic or endocrine therapies. Although mean and top tertile quality of life scores appeared to be better in patients categorized as stable (49 patients) or responding (39 patients) to treatment, this association was not statistically significant. The symptom status refers to the physician's assessment as to whether symptoms had been progressing, stable or improving during the weeks since last out-patient visit. Quality of life scores correlated with the physician's assessment of the status of symptoms ($p < 0.01$), and the percentage in the top tertile was significantly lower in those respondents whose symptoms were categorized as worse since the last assessment ($p < 0.05$). The trichotomized scale of will to live was associated with quality of life scores ($p < 0.001$), and the percentage in the top tertile was higher in those respondents categorized as having a very strong will to live ($p < 0.01$). Belief in curability was also associated with better quality of life scores and a higher percentage of respondents in the top tertile quality of life scores ($p < 0.01$ and $p < 0.05$, respectively), but there was

Table 6. Quality of life scores and distribution of physician measures, patient attitudes and beliefs, and use of alternative treatments

	Mean quality of life scores (S.D.)	Percent in top tertile of quality of life scores
ECOG performance ^a		
Score	a, b	c
0	6.78 (1.93)	44.07
1	7.30 (1.86)	30.00
2,3	8.32 (1.79)	10.71
Objective response ^b		
CR/PR	d, e	f
NC	6.94 (1.64)	36.11
PD	7.22 (1.98)	35.56
	8.04 (2.22)	20.83
Symptom status ^a		
Improving	g, h	i
Stable	6.95 (1.82)	38.81
Worse	7.16 (2.02)	34.69
	8.19 (1.85)	12.90
Will to live ^c		
Very strong	j, k	l
Strong	6.48 (1.85)	44.83
Moderate	7.77 (1.75)	22.92
	7.84 (1.98)	25.64
Belief in curability ^d		
Curable	m, n	o
Uncertain	6.53 (1.73)	46.15
Incurable	7.25 (2.02)	34.92
	7.93 (1.80)	15.91
Use of alternative treatments ^d		
Committed use	p, q	r
No/minimal use	6.85 (2.03)	42.42
	7.41 (1.91)	29.20

^aTwo items incomplete.

^bOnly 105 patients on systemic treatment evaluable for objective response.

^cFour items incomplete.

^dThree items incomplete.

Unadjusted

a. $F(2,144)=6.41, p<0.01$

d. $F(2,102)=2.45, p=ns$

g. $F(2,144)=4.67, p<0.01$

j. $F(2,142)=8.86, p<0.001$

m. $F(2,143)=5.69, p<0.01$

p. $F(1,145)=2.17, p=ns$

Adjusted

b. $B=0.34, p<0.001$

e. $p=ns$

h. $p=ns$

k. $B=0.20, p<0.05$

n. $p=ns$

q. $p=ns$

Chi-square

c. $\chi^2(4)=15.29, p<0.1$

f. $\chi^2(4)=7.45, p=ns$

i. $\chi^2(4)=10.27, p<0.05$

l. $\chi^2(4)=16.29, p<0.01$

o. $\chi^2(4)=11.64, p<0.05$

r. $\chi^2(2)=3.11, p=ns$

no association between a committed use of alternative treatments and quality of life scores. When the six independent variables were entered into a multiple regression analysis, with quality of life scores as the dependent variable, will to live and performance status were again identified as significant independent predictors of quality of life, with r^2 of 0.18 and 0.30, respectively. The remaining variables were not independent predictors of quality of life. The overall regression model was significant ($F_{1/6; 96} = 4.92; p_{50:001}$), and accounted for 24% of the variance in quality of life.

DISCUSSION

The methodology of health related quality of life measurement is now well established in cancer research. As a result, this concept is an important reference point for enquiry into those attributes that contribute to the perception and experience of life. Oncology research has focused on a variety of health related attributes that contribute to quality of life and indeed the measurement of these attributes has also been applied to the general community (Hjermstad et al., 1998). In the current study, a scale of quality of life was developed which emphasized happiness and satisfaction. The internal consistency of this scale fell within the conventionally accepted limits of reliability (Nunnally, 1978). At the time of this study (Yates et al., 1993), instruments were already available from the literature but,

in general, these instruments did not interpret global quality of life in terms of happiness and satisfaction. Since that time, other scales of quality of life have been developed and utilized in cancer research. However, many scales are narrow in focus, interpreting quality of life in a health related manner, typically with an emphasis on symptoms and functioning based on a time frame of the immediate past (Aaronson et al., 1993; Testa and Simonson, 1996).

In considering illusory attitudes and beliefs in the context of quality of life, the validity of the current instrument of global quality of life was supported by a correlation with accepted measures. For example, there was a strong correlation between ECOG performance status and mean and good quality of life scores (Table 6). These results are consistent with other reports of this association (Schipper et al., 1984; Selby et al., 1984; Morrow et al., 1992; Bliss et al., 1992). In this study, clinicians rated whether the symptom status of the patient was improving, stable or worse since the last assessment. In general, there was a correlation between the physician's assessment of the status of symptoms and quality of life scores (Table 6). This correlation is supported by the results of other studies of the impact of cancer related symptoms (Sarna, 1993) and side-effects of treatment (Pater et al., 1992; Lindley et al., 1992; O'Brien et al., 1993) on the measurement of quality of life.

As part of the standard of clinical care, patients were reviewed regularly and were informed verbally about the status of their cancer. This information included discussion about the incurability of the cancer, the palliative goal of treatment, the on-going progress of their cancer, and the response to treatment. Despite this information, only 45 patients (31%) indicated they believed that their cancer was incurable (Table 4). One possible explanation of this observation is inadequate verbal communication. However, none of the patients who believed that their cancer was incurable reported that the doctor had stated that the cancer was curable. In the current study, 39 patients (27%) believed that the cancer was curable. This result is similar to the study of Mackillop et al. (1988) who reported a belief in curability by 33% of patients with metastatic cancer who had been informed of the palliative goal of treatment. Of the patients who believed that their cancer was curable, 16 (41%) reported that their doctor had stated that the cancer was curable, but another 15 patients (38%) reported that their doctor had stated that the cancer was incurable. The pattern of this latter response indicates that some patients acknowledged conflicting views about the curability of their cancer. The development of positive attitudes and patterns of belief and behaviour to cope with a negative event are well documented in psychosocial research, and other studies have documented a belief in curability by patients with advanced cancer (Butow et al., 1999; Richardson et al., 2000) since the time of the report by McKillop et al. (1988) and the current study (Yates et al., 1993). For patients with advanced cancer, the expression of uncertainty and conflicting beliefs are consistent with the use of illusion (Taylor et al., 1989) as an adaptive process to deal with the prospect of a fatal illness. The use of alternative treatments also supports the importance of illusory beliefs for some patients since these approaches are typically promoted as a cure for cancer. Committed users of alternatives to conventional medical treatments in this study were more likely to believe in the curability of their cancer than patients who did not use alternative treatments or who made only minimal alternative changes to their lifestyle (Table 5).

The development of illusions, with a bias towards a positive self-perception, is now recognized as a feature of normal psychological behaviour (Taylor and Brown, 1988). Positive illusions allow individuals to see themselves as different from others and can lead to an unrealistic self-assessment, an unduly optimistic view of the future and an exaggerated belief in the ability to control environmental events. The consequences of positive illusions can include happiness and productive social activity, both important attributes contributing to the perception of quality of life. For patients with advanced cancer, support for this notion is provided by the distribution of quality of life scores within the scale of belief in curability (Table 6). Quality of life scores and the likelihood of a good quality of life were strongly associated with the scale of belief in curability.

To date, there has been little evaluation of the factors that drive illusory beliefs in patients with advanced cancer, but the expectation of benefit from treatments of minimal (Slevin et al., 1990) and unproven (Daugherty et al., 1995; Bagenal et al., 1990) efficacy suggests that a desire for cure and a strongly developed will to live are important attributes that influence the behaviour of some patients. In the current study, the scale of will to live showed a significant association with quality of life scores (Table 6). This finding supports the view that positive illusory attitudes and beliefs represent a means of coping with a life-threatening event for some patients. In psychosocial research, patterns of coping with stressful daily events by healthy people and by patients with cancer recognize a variety of individual responses, some realistic and others illusory (Dunkel-Schetter et al., 1992; Folkman et al., 1986). In the current study, the relationship between quality of life scores and both an inappropriate belief in curability and a strongly developed will to live strengthens the interpretation that the measurement of quality of life by some patients was not based on a realistic appraisal of their situation.

In the current study, the relationship of health related measures and global quality of life has been documented and, in addition, an illusory domain, characterized by certain beliefs and attitudes, has been identified as a potentially important contributor to the experience of life by some patients with advanced cancer. Within this illusory domain, will to live was strongly associated with global quality of life. Will to live is a concept that has received little attention in psychosocial research (Carmel and Mutran, 1997). Patients with advanced cancer are an ideal group to test the concept of will to live because they face the prospect of dying but, if they respond to palliative treatment, can postpone death. In contrast to quality of life which is a psychosocial construct describing a bigger picture of the experience of life, will to live is a more fundamental concept and is not as readily amenable to description or measurement. For example, any attempt to interpret will to live as a fundamental driving force of existence inevitably leads towards philosophical debate and uncertainty. One possible interpretation is that will to live is a pattern of behaviour that is reflex driven and unthinking. In this model, will to live is seen as a manifestation of instinct; an action that takes precedence over any thought of the consequences of that action. From this perspective, will to live drives those aspects of thought that create and shape illusions. An alternative model sees will to live as a chosen course of action, part of a thought process which blends into a constellation of psychological attributes that create illusions. As a result, will to live is part of a psychological adaptive strategy to a life threatening illness. Each model is plausible but subject to controversy as progressively more complex explanations penetrate deeper into the

differing philosophical viewpoints. Does will to live fit the philosophical interpretation of will as a fundamental, perhaps even aimless, metaphysical force or is will to live part of a rationalist explanation of being? The measurement of the concept of will to live in the current study does not provide a method of addressing the place of will to live in the hierarchy of being. Nevertheless, for these patients who faced the prospect of death, will to live emerged as a relevant force in their lives. Not surprisingly, these patients scored will to live towards the positive end of the scale. Distortion away from a normal distribution could be interpreted as a feature of innate behaviour or a fundamental metaphysical force, but equally this skewed distribution may simply be part of an adaptive psychological process. Furthermore, neither explanation is necessarily mutually exclusive. Despite the limitation of trying to identify the place of will to live in the hierarchy of being and survival, this concept appears to be an important component of the positive illusions that some patients exhibited in this study. So strong was this concept that both will to live and performance status remained correlated with quality of life scores after adjustment for other variables (Table 6).

Caution needs to be exercised in the interpretation of these results. A multitude of factors contribute to the perception of quality of life and a potential source of error is incorrect attribution of a causal association of the variables under study. If attitudinal factors include the presence of unrealistic belief systems, there are several important clinical implications. A subjective response to palliative treatment might reinforce an illusion of cure, and therefore a good quality of life might be a surrogate measure of a patient's will to survive a cancer. If this is the case, the use of quality of life as an end point of clinical trials of cancer treatments could be viewed as compromised because the measurement by some patients will be influenced by factually incorrect beliefs. On the other hand, there could be important positive outcomes as a result of illusory beliefs and a strongly developed will to live. For example, physician and patient rated quality of life measures are associated with higher scores and better survival in metastatic breast cancer (Coates et al., 1992; Sideman et al., 1995) and melanoma (Coates et al., 1993). Irrespective of these practical implications, the results of this study indicate that illusory attitudes and beliefs, long recognized in psychosocial research, can be measured and appear to be an important domain contributing to the perception of quality of life in some patients with advanced cancer.

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