



Quality of life and level of functioning in cancer patients: The roles of behavioural inhibition and approach systems

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ABSTRACT

Psychosomatic medicine shows that individual differences in psychological factors are implicated in physical disease. However, the influence of personality on cancer-related psychological outcomes has not been clarified. The aim of this article is to contribute to this literature in terms of the reinforcement sensitivity theory (RST) approach to personality. Measures of the Behavioural Inhibition System (BIS) and the Behavioural Approach System (BAS) were examined in relation to quality of life (QoL) and level of functioning (LoF) in 48 cancer patients (compared with non-clinical controls). Personality differences were measured by the Carver and White (1994) BIS/BAS Scales; and QoL and LoF by the EORTC QLQ C30. Both BAS Fun Seeking (BAS-Fun) and BAS Reward Responsiveness (BAS-RR) interacted with the cancer-control factor on LoF, with higher scoring individuals on both sub-scales reporting higher LoF in the cancer group. BAS-RR interacted with cancer-control factor on QoL, with higher scoring individuals reporting a higher QoL in the cancer group. As expected, on both QoL and LoF, scores were significantly lower in the cancer group. Implications of this study for future personality-based cancer research are discussed.

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1. Introduction

Psychosomatic medicine has revealed a number of psychological factors implicated in physical disease, and individual differences in these psychological factors have attracted research attention (for an overview, see Elovainio & Kivimaki, 2009). The aim of this article is to relate personality factors from one major neuropsychological model of personality, namely reinforcement sensitivity theory (RST; Corr, 2008), to one major class of physical disease, namely cancer. We focus on the effects of cancer, and the roles played by personality, on two psychosocial factors: (a) quality of life (QoL), and (b) level of functioning.

Cancer is one of the leading causes of death (Karim-Kos et al., 2008), and the World Health Organisation (WHO) estimate that, by 2020, globally more than 100 million will die from it each year (Higginson & Costantini, 2008). Current incidence rates suggest that one in three European citizens will develop cancer during their lifetime, and cancer is currently the 4th most frequent cause of death, with 1.2 million cancer-related deaths occurring in 2006 (Albrecht, McKee, Alexe, Coleman, & Martin-Moreno, 2008). With the development of newer and more effective therapies, the mean age of the population affected by cancer is increasing (Higginson &

Costantini, 2008). QoL has, therefore, become a primary issue for the increasing number of young and older people who survive and live with a diagnosis of cancer. In general, cancer has a significant detrimental and long-lasting effect on physical and psychological QoL (Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Hensch, Bergman, Gustafsson, Gaston-Johansson, & Danielson, 2007), even on those who are successfully treated (Ganz, Rowland, Desmond, Meyerowitz, & Wyatt, 1998; Ganz et al., 2002; Robb et al., 2007).

1.1. Personality and cancer

There is considerable variation in how patients react to illness and, consequently, there is considerable variation in levels of health-related QoL (Birkhaug, Aarstad, Aarstad, & Olofsson, 2002; Carver et al., 2005; Chochinov et al., 2006; Hensch et al., 2007; Kurtz, Kurtz, Given, & Given, 2008; Llewellyn, McGurk, & Weinman, 2005; Millar, Purushotham, McLatchie, George, & Murray, 2005; Rolke, Bakke, & Gallefoss, 2008; Schwarzer, Boehmer, Luszczynska, Mohamed, & Knoll, 2005). A patient's ability to adjust is an important factor in determining their eventual psychological and physiological outcomes. Evidence suggests that this variation in coping ability is not due to the nature or the severity of the illness alone, but may also be attributed, at least in part, to personality

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factors (e.g., Carver, Meyer, & Antoni, 2000; Llewellyn et al., 2005; Millar et al., 2005).

The nature of the type and influence of personality on cancer-related psychological outcomes has not been clarified. The major aim of this article is to contribute to this clarification in terms of one major approach to personality, namely reinforcement sensitivity theory (RST; Gray & McNaughton, 2000.; for a summary, see Corr, 2008). RST is a theory which aims to provide a framework with which to understand the major dimensions of personality by taking neural and psychological processes into account (Corr, 2009). It is the direct descendant of Hans Eysenck's theory of personality, which had initially looked at levels of arousal and arousability as factors underlying individual differences in personality (Corr, 2008). Jeffrey Gray (1975), revising Eysenck's theory, postulated that Eysenck's Extraversion and Neuroticism scales should be rotated to form axes reflecting individual differences in conditioned reward and punishment sensitivity: these systems are referred to as the Behavioural Inhibition System (BIS; said to regulate the passive avoidance of conditioned punishment), and the Behavioural Approach System (BAS; said to regulate approach to conditioned reward). More recently (Gray & McNaughton, 2000), the details of these systems have been substantially revised (for a detailed exposition of these systems, see Corr, 2008).

Traits such as optimism, planning, and neuroticism are fundamental constituents of the BAS and BIS elements of RST – the FFFS has received much less attention. These traits have been shown to have a significant effect on the perceived QoL of cancer patients (Chochinov et al., 2006; Humphris & Ozakinci, 2006; Kurtz et al., 2008; Llewellyn et al., 2005; Schwarzer et al., 2005). RST, therefore, provides a well-developed theoretical framework to guide the study of patients' fundamental judgments of, and reactions to, aversive and ambiguous (e.g., in terms of outcome) situations, such as those seen in cancer patients' day-to-day QoL. The major aim of this article is to explore these possibilities.

Winefield (1995) describes QoL as being a multidimensional construct of a person's well-being, composed of physical and objective parameters, as well as subjective psychological ones. The subjective or objective nature of these parameters does not undermine their importance, since quality of life is a complex relationship between life events, their contexts, and self-evaluation. Measures of QoL can, therefore, reflect the perceived effect of a disability or disease on an individual's life, based on his/her own account of the experience. Consequently, inter-individual variation in reported levels of QoL is, in part, due to cognitive styles and, thus, possibly personality factors.

For example, Millar et al. (2005) investigated the correlation between psychological morbidity and the major dimensions of personality 3, 6 and 12 months after surgery in a sample of 371 female breast cancer patients. These data revealed that, although mean levels of stress dropped over time, over a quarter of the sample maintained a significant level of distress for the entire duration of the study. Those who reported continuing distress at the 6 and/or 12 month check-up (medium and long-term distress groups) had significantly higher scores on neuroticism, fatalism, and anxiety, and reported that they perceived greater symptom impact and had significantly poorer general health. These short-term, medium-term, and long-term patient groups did not differ in terms of their surgical allocation, treatment, or long-term clinical outcome. Therefore, this study shows that high-levels of neuroticism are associated with lower levels of QoL; and, importantly, it provides evidence to support the claim that it is not merely the severity of the cancer that determines QoL but also patients' *perception and appraisal* of the severity and consequences of the cancer. Similarly, personality and cognitive components have been related to different QoL evaluations (Secchi & Strepparava, 2001). For example, Carver et al. (2005) showed, in a longitudinal study, that

personality factors and initial well-being were strong predictors of subjective long-term well-being (medical factors had a much lower predictive value).

1.2. Research hypotheses

There is very little research linking RST constructs to the psychology of cancer patients and, to our knowledge, never in relation to the quality of life of cancer patients. In this respect, our work is largely exploratory. However, our preliminary hypotheses were that BIS levels would be negatively correlated with quality of life (QoL) and level of functioning (LoF), and positively correlated with symptom severity (SS; it is expected that individuals with a greater tendency of making negative attributions would be prone to over-reporting their symptomatology). We also expected that the three subcomponents of the BAS, namely, BAS Drive (BAS-D), BAS Fun Seeking (BAS-Fun) & BAS Reward Responsiveness (BAS-RR), would be positively correlated with QoL and LoF.

2. Methods

2.1. Participants

Ninety-six people participated in the study. Forty-eight had recently received a diagnosis of bowel, breast, esophageal, or lung cancer, with the time of diagnosis ranging from two months to two years prior to the initiation of the study (mean age of 59.21, S.D = 12.2; range: 28–86). In many cases, the gender of these participants was not made known to the researchers due to concerns over privacy.

Patients were contacted either at the Lemesos New General Hospital's Oncology Department, via the Cyprus Association of Cancer Patients and Friends, or at private clinics. The forty-eight non-cancer participants were drawn from the general public (mean age of 41.1, S.D = 12.85; range: 23–66). The only exclusion criterion was a diagnosis of cancer at any point throughout their lifespan. Their gender was omitted from the analysis in lieu of the lack of such information for the patient sample. All participants were treated in accordance with the Ethical Principles of Psychologists and Code of Conduct (American Psychological Association, 1992).

2.2. Materials

Participants completed the European Organization for Research and Treatment of Cancer (2001) Quality of Life Questionnaire (EORTC QLQ) C30 (version 3), which is one of the most widely used measures of cancer-related quality of life (QoL). It is a 30-item instrument measuring level of functioning (LoF), symptom severity (SS), and quality of life (QoL).

We employed the well-established and widely-used Carver and White (1994) BIS-BAS Scales to measure the two main systems of RST, namely the Behavioural Inhibition System (BIS) and the Behavioural Approach System (BAS). Broadly speaking, these may be defined as psychometric measures of individual differences in reactions to reward and punishment (Corr, 2008), or, more broadly defined, individual differences in perception of loss and gain, respectively (Hall, Chong, McNaughton, & Corr, in press). The BIS/BAS scales are composed of three BAS sub-factors (Drive, Fun-Seeking & Reward Responsiveness) and one BIS scale.

The materials were selected due to their validity, relevance and extensive prior application. The general consensus regarding the accuracy of the two questionnaires, as well as the frequent use of the EORTC QLQ in clinical settings, meant that it would be possible for future studies or clinicians to replicate these methods. The

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