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## Personality is associated with health status and impact of cancer among melanoma survivors

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### ABSTRACT

**Objective:** We aimed to investigate the prevalence of Type D personality (the conjoint effects of negative affectivity and social inhibition) among melanoma survivors and to obtain insight into its effects on health status, impact of cancer and health care utilisation.

**Methods:** We selected all patients diagnosed with melanoma between 1998 and 2007 from three large regional hospitals in the Netherlands. In total, 699 survivors, alive in January 2008, received a questionnaire including Type D personality scale (DS14), impact of cancer questionnaire (IOC) and SF-36 and 80% responded ( $n = 562$ ).

**Results:** Twenty-two percent of survivors ( $n = 125$ ) were classified as Type D. They reported a clinically and statistically significant worse general health (57.8 versus 75.6), social functioning (73.1 versus 88.7), mental health (61.7 versus 80.6), more emotional role limitations (67.8 versus 89.4) and less vitality (54.5 versus 72.8) than non-Type D patients. Additionally, they reported a statistically and clinically relevant higher impact of cancer on body changes, negative self-evaluation, negative outlook on life, life interferences and health worry. Furthermore, they were more worried about the influence of the sun on their skin and acted accordingly. No differences were found in health care utilisation.

**Conclusions:** Type D personality has a distinct negative impact on health status in melanoma survivors and is an important factor to screen for in clinical practice. Giving special attention to these patients is important while they are more likely to experience a strong impact of cancer which cannot be explained by socio-demographical or clinical characteristics.

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## 1. Introduction

The relationship between personality and cancer has been an important topic of many studies. Major research themes were the association between personality and cancer incidence<sup>1–7</sup> and disease outcomes or mortality.<sup>8–10</sup> However, in these studies personality was defined in a number of different ways and the results were inconclusive. A personality type that has

a major impact on cancer incidence, course, disease outcomes and health status has not yet been found.

A distressed personality (Type D) is defined by the combination of two personality traits; the tendency to experience negative emotions (*negative affectivity*) and to inhibit self-expression in social interaction (*social inhibition*).<sup>11</sup> Hence, individuals with a Type D personality are inclined to experience emotional and interpersonal difficulties across time

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and situations. In the cardiovascular field, the Type D is an important research topic. Type D is recognised as an important determinant for adverse health outcomes, impaired health status and health-related quality of life (HRQL), several forms of distress (including anxiety, depression and posttraumatic stress) and a decrease in health care utilisation in patients with cardiovascular diseases.<sup>12–18</sup> More recently, similar results have been found in patients with a range of other diseases as well.<sup>19–21</sup> In addition, Type D personality was a prognostic factor for the development of cancer in men with established coronary heart disease, who were free of cancer at baseline.<sup>22</sup>

Although Type D has proven to have much explanatory power to select cardiovascular patients at risk for a low health status, this has not yet been studied in cancer patients. The aim of this study was to determine if melanoma survivors with a Type D personality report a comparable health status, impact of cancer and health care utilisation compared to those without a Type D personality. We hypothesised that Type D patients will report a lower health status, a more negative impact of cancer and a lower health care utilisation compared to those without a Type D personality.

## 2. Methods

### 2.1. Setting and participants

The study was conducted at the Eindhoven Cancer Registry (ECR), which records data on all patients newly diagnosed with cancer in the southern region of the Netherlands.<sup>23</sup> The ECR was used to select all patients diagnosed with melanoma between 1 January 1998 and 1 August 2007 from three large regional hospitals. Melanoma was defined using the ICD-0 codes: C44.0–C44.9 with morphology 8720–8790. Participants older than 85 years of age at the time of survey were excluded, as it was expected that they would have difficulty in completing a self-administered questionnaire without assistance. To avoid including deceased patients, our database was linked with the database of the Central Bureau for Genealogy, which collects data on all deceased Dutch citizens via the civil municipal registries. Data collection was performed between February and April 2008. Approval for this study was obtained from a local certified Medical Ethics Committee.

### 2.2. Data collection

Medical specialists sent their (former) patients a letter to inform them about the study and a copy of the questionnaire. The letter explained that by returning the completed questionnaire, the patient agreed to participate and consented with linkage of the outcome of the questionnaire with their disease history as registered in the ECR. The patients were reassured that non-participation would not have any consequence for their follow-up care or treatment.

### 2.3. Measures

#### 2.3.1. Patient and tumour characteristics

The ECR routinely collects data on tumour characteristics, including date of diagnosis, histology, clinical stage

(tumour-node-metastasis clinical classification<sup>24</sup>), treatment and patient background characteristics including date of birth and comorbidity at the time of diagnosis (a slightly adapted version of the Charlson comorbidity index<sup>25</sup>).

In addition, our patient questionnaire also included questions on sociodemographic data, including marital status, current occupation, educational level, current comorbidity and disease progression (e.g. recurrence, metastasis and new primary tumour).

#### 2.3.2. Type D personality

Type D personality was measured with the 14-item Type D personality scale (DS14).<sup>11</sup> The DS14 is self-administered and takes only a few minutes to complete. The 14 items of this scale are answered on a five-point response scale ranging from 0 (false) to 4 (true). Seven of these items refer to 'Negative Affectivity' or the tendency to experience negative emotions in general (e.g. *I am often down in the dumps*). The remaining seven items refer to the patient's level of 'Social Inhibition' or the tendency to inhibit the expression of emotion in social relationships (e.g. *I am a closed kind of person*). The patients were categorised as Type D using a standardised cut-off score  $\geq 10$  on both the negative affectivity and social inhibition subscales, following the protocol as previously established.<sup>11</sup> The DS14 is a valid and reliable scale with Cronbach's  $\alpha$  of 0.88/0.86 and a test-retest reliability over a 3-month period of  $r=0.72/0.82$  for the two subscales, respectively.<sup>11</sup>

#### 2.3.3. Health status

The Dutch version of the SF-36 questionnaire was used to assess the health status.<sup>26</sup> It incorporates two composite scales – the Physical Component Scale and the Mental Component Scale<sup>27</sup> – derived from eight domains: physical functioning, role limitations due to physical health problems, bodily pain, general health perceptions, vitality, social functioning, role limitations due to emotional problems and general mental health.<sup>28</sup> According to standard scoring procedures, the subscales were linearly converted to a 0–100 scale, with higher scores indicating better functioning.

#### 2.3.4. Impact of cancer

The impact of cancer was measured with the impact of cancer questionnaire (IOC). The IOC is a relatively new instrument developed to measure subtle yet important aspects of the cancer survivorship experience that long-term survivors themselves indicate are important.<sup>29</sup> The instrument consists of 41 items covering 10 subscales; health awareness, body changes, positive and negative self-evaluation, positive and negative life outlook, life interferences, value of relationships, meaning of cancer and health worry. Furthermore, these subscales can be used to create two overarching second-order factors inclusive of positive and negative items; the 'higher order positive scale' and 'higher order negative scale'.<sup>30</sup> Internal consistency for these subscales ranged from 0.67 to 0.89. All items are scored on a five-point scale through which respondents indicate their level of agreement. A higher score on a subscale means stronger endorsement of that content area; a high score on a positive scale thus means a higher positive impact of cancer, while a high score on a negative scale

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