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Personality and disease-related appraisals in patients diagnosed with acute lymphocytic leukaemia and multiple myeloma: A preliminary report

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Abstract

Introduction: There are studies in the literature on the relationship between personality and adjustment to illness. The way a person assesses their illness has an impact on how they feel and function. The aim of the study was to explore the relationship between personality and self-assessment of disease in patients with acute lymphocytic leukemia and multiple myeloma.

Patients and methods: The study group consisted of 41 patients with a diagnosis of acute lymphocytic leukemia and multiple myeloma aged 47–84 (mean 65.50 ± 9.37). Women comprised 39% of the study subjects and men 61%. Subjects were assessed with the NEO–FFI Personality Inventory by Costa and McCrae and the Disease–Related Appraisals Scale by Steuden and Janowski.

Results: The analyses carried out demonstrated the relationship between personality dimensions and the assessment of one's own illness. Neuroticism was found to be associated with the evaluation of the illness as a benefit, extraversion was associated with harm, agreeableness with obstacle/loss, and conscientiousness with threat, challenge and value.

Conclusions: Patients who scored higher on neuroticism assess their disease as being less of a benefit to them. Patients with higher extroversion level perceive their disease as being less of

a harm to them. The more agreeable patients are, the more inclined they are to see their disease as an obstacle/loss. The more conscientiousness patients are, the less likely they are to see their disease as a threat, challenge or value.

Key words: Blood cancer, acute lymphocytic leukemia, multiple myeloma, personality

Introduction

Cancer is often associated with pain, anxiety and stress [1]. Depending on the stage of the disease and the intensity of pain, patients experience specific emotions. The complains they suffer from often change the hierarchy of their goals and activities. Pain, which is often the first perceptible manifestation of the disease, can interfere with cognitive and emotional processes as well as patients' relationships with other people [2]. A malignancy often leads to depressed mood, nervousness, anger, sadness and regret. Such emotions affect patients' perceptions of the disease and their behaviour, which may differ substantially from the way they used to comfort themselves before they fell ill. Family and friends will obviously notice the change in the patient's conduct, which can affect their relationships with each other [3, 4]. Leukaemia, which is a cancer of the haematopoietic system, involves pathological, uncontrolled and excessive growth of immature white blood cells [5]. These cells can be more or less deleterious to the body, depending on the type of leukaemia. They displace mature, properly developed cells from the bone marrow, preventing normal blood production, which may lead to anaemia and thrombocytopaenia [5]. Plasma cell myeloma, also known as multiple myeloma or Kahler's disease, is a blood malignancy that affects plasma cells. In a healthy person, new plasma cells replace old cells that are no longer needed. This process takes place in a fixed order and is strictly controlled by the body. The situation is different in patients with myeloma, in whom large numbers of immature plasma cells are produced, which interfere with normal production of red blood cells, white blood cells and platelets. Malignant plasma cells secrete large amounts of abnormal antibodies (paraproteins or M proteins) which are unable to fight infection and inhibit the development of normal antibodies. These cells are found in the bone marrow and often cause bone pain or multiple fractures. Common symptoms of this type of myeloma include anaemia, osteoporosis, frequent infections, kidney failure, fatigue and sleepiness, and, above all, bone and joint pain [6].

Relationships between personality and adaptation to disease are a frequently studied construct [7, 8]. Researchers distinguish two characteristic groups of patients who differ in the way they experience and go through the disease process. One group are those patients who have relatively adapted to the disease, and the other group are vulnerable individuals, who have poorer adaptation outcomes. Patients who are better adapted to the disease have high openness and agreeableness scores, moderate extroversion and conscientiousness scores, and low neuroticism to experience scores. More vulnerable patients score high on the neuroticism scale, moderately on the agreeableness scale and very low on the extroversion, openness and conscientiousness scales [9].

In a study of 296 patients suffering from neuropathic and somatic pain, Soriano and colleagues [10] observed that a high neuroticism score correlated with vulnerability, but a low neuroticism score did not guarantee good adjustment to the difficult situation of a disease and the associated pain. Another study confirmed the importance of personality traits in emotional adjustment to cancer [11], particularly conscientiousness, which has a very positive impact on the way an individual confronts the problem of having a malignancy. A study conducted among 234 Chinese patients demonstrated that extroversion and neuroticism were associated with positive affect. Boryczko-Pater [12], in a study conducted among patients suffering from head and neck cancer, looked for relationship between personality and coping strategies using the revised version of the Eysenck Personality Questionnaire (EPQ–R) and Mental Adjustment to Cancer (Mini–MAC) scale. The results indicated that patients with higher levels of extroversion were less likely to show hopelessness and helplessness compared to those who had low extroversion or high neuroticism scores.

On the other hand, patients with arterial hypertension displayed higher levels of neuroticism and extroversion compared to healthy subjects. It has also been shown that people with higher levels of neuroticism have lower quality of life scores [13]. Also interesting is the patient's approach to the disease and how perceptions of the disease affect their well-being. The way a person approaches their disease depends on their personality predispositions, including self-confidence and optimism, the level of which is comparable at the time of diagnosis and follow-up [14]. Chronically ill patients differ in personality traits from healthy people. However, people with different diseases also have distinct personality structures. Interesting results were obtained in a study which compared cancer patients with arterial hypertension patients and coronary artery disease patients. Patients with malignancies had lower neuroticism scores and higher agreeableness and conscientiousness scores than the subjects

from other groups, but the groups did not differ in extroversion and openness to experience [15].

The way a patient perceives cancer is vital for the recovery process [16, 17]. Many people see cancer through the prism of body damage, and that patients who exhibit greater responsibility for their health perceive the disease as less burdensome than those who do not believe that they have an impact on their well-being [18]. A study of the relationship between the personality structure of patients with psoriasis and their appraisals of their disease showed that patients with higher levels of neuroticism were more likely to see their disease as a threat. In the group of psoriasis patients, no significant relationship was found between benefit and value appraisals of the disease and personality factors. By contrast, appraisals of the disease as an obstacle/loss correlated positively with neuroticism, and negatively with extroversion, agreeableness and conscientiousness. That study also demonstrated that the more patients viewed their illness as a challenge, the higher were their extroversion and conscientiousness scores. The harm and meaning appraisal subscales correlated positively with neuroticism. However, the higher patients' harm appraisal scores, the lower were their agreeableness and conscientiousness scores [19]. The aim of the study was to investigate the relationship between personality traits and cognitive appraisal of disease in patients diagnosed with lymphocytic leukaemia and myeloma. The main problem of the study is outlined in the following question: Is there a relationship between personality structure and disease appraisal in patients with blood cancer, and what is this relationship.

Patients and methods

The study included 41 patients among which 16 (39%) were women and 25 (61%) men, diagnosed with acute lymphocytic leukaemia (ALL) and multiple myeloma (MM), aged 47–84 (mean = 65.5); patients with MM aged 65.8 ± 9.45; patients with ALL aged 64.9 ± 9.56. All participants were in-patients treated for myeloma (n = 28, 68.3%,) and acute lymphocytic leukaemia (n = 13, 31.7%). The patients in the sample were at different stages of the disease and their life situations were different (Table 1).

The study was conducted at the Department of Haematology of Zamojski Szpital Niepubliczny (Zamość Non-Public Hospital), after obtaining consent from the Ethical Committee for Scientific Research of the Institute of Psychology of The John Paul II Catholic

University of Lublin. Participation in the study was voluntary. The subjects were assured of anonymity and confidentiality of research data.

Table 1. Socio-demographic characteristics of patients studied

Variable	N	Percentage
Gender		
Women	16	39.0
Men	25	61.0
Diagnosis		
Multiple Myeloma	28	68.3
Acute Lymphocytic leukaemia	13	31.7
Place of Residence		
Rural area	26	63.4
Urban area of less than 20,000 inhabitants	6	14.6
Urban area from 20,000 to 100,000 inhabitants	9	22.0
Education		
Primary	10	24.4
Secondary	21	51.2
Higher	3	7.3
Basic vocational	7	17.1
Marital status		
Single	6	14.6
Married	32	78.0
Widowed	3	7.3

The patients were surveyed using a Personal Inquiry Form and two psychological measures: Costa and McCrae's NEO–FFI [20] and Steuden and Janowski' Disease–Related Appraisals Scale (DRAS) [21].

NEO-FFI measures 5 personality traits: neuroticism, extroversion, openness to experience, agreeableness, and conscientiousness. Cronbach's alpha reliability of the individual scales of the Polish translation of the inventory [22] ranges from 0.68 to 0.82. Neuroticism is a dimension that reflects emotional adjustment versus emotional instability and manifests itself, among others, in maladaptive stress responses. Extroversion relates to the quantity and quality of interpersonal relationships, the ability to enjoy life, and the need for stimulation. Openness to experience a factor responsible for the drive to seek out new activities, curiosity, and the willingness to explore the unknown. Agreeableness describes the quality of interpersonal

relationships on a continuum from altruism to antagonism. Lastly, conscientiousness covers motivation and goal–focused behaviours [23].

DRAS is an instrument that measures the subjective meanings that individuals assign to their own disease as belonging to the following categories: threat, benefit, obstacle/loss, challenge, harm, value, and meaning (a control scale). Cronbach's α reliability coefficient for the DRAS scales ranges from 0.64 to 0.87 [21]. The threat scale relates to perceptions of the disease as disturbing one's life balance and leading to a destabilization of the entire family system. Disease perceived as a benefit is associated with obtaining secondary gains, e.g. exemption from everyday duties and obligations. The obstacle/loss scale describes disease in terms of limitations and barriers that thwart patients' plans. Disease viewed as a challenge is an enemy that must be faced. Disease assessed as a harm is perceived as an unfair and harmful event, which has no discernible meaning. The value scale describe disease as an event that may not be easy to understand and accept, but to which an individual attributes a deeper significance. The meaning scale measures how important an event the disease is to a given person [21].

Results

The results were analysed statistically to determine the relationships between the dimensions of the personality structure and disease-related appraisals. It turned out that the higher the neuroticism level, the lower was the benefit appraisal score. Extroversion correlated negatively with harm appraisal. The survey carried out in the group of ALL and MM patients showed that the higher the subjects' agreeableness scores, the higher was their inclination to view the disease as an obstacle/loss. Conscientiousness, on the other hand, was negatively correlated with threat, challenge and value appraisals, as shown in Table 2.

Table 2. Correlations between personality factors and disease-related appraisals

Variables	Threat	Benefit	Obstacle/Loss	Challenge	Harm	Value	Meaning
Neuroticism	−.01	−.30*	−.14	.20	.02	.07	.24
Extroversion	−.09	−.22	−.11	−.10	−.39**	−.22	.05
Openness to experience	.13	.04	.05	−.11	.12	.15	−.06
Agreeableness	.04	.15	.32*	.00	.19	−.23	−.01
Conscientiousness	−.39**	−.14	−.08	−.40**	−.19	−.49**	−.14

$^{**}p < 0.01$, $^{*}p < 0.05$

To explain the subjects' disease–related appraisals, a regression analysis of the individual personality dimensions was performed. The following personality variables turned out to be significant predictors of disease–related appraisals: conscientiousness, agreeableness, and extroversion. Conscientiousness explained about 15% of the variance in threat appraisal, agreeableness explained about 10% of the variance in perceiving the disease as an obstacle/loss, conscientiousness explained 16% of the variance in challenge appraisal, extroversion — 15% of the variance in harm appraisal, and conscientiousness — 20% of the variance in value appraisal. The results of the stepwise regression analysis are shown in Table 3.

Table 3. Personality constructs explaining variance in the individual dimensions of disease–related appraisal

Independent variable	**Beta**	**t**	**p**
Regression of the dependent variable: **threat** R = .39; R^2 = .15; F = 6.79; p = .013			
Conscientiousness	–.39	–2.61	.013
Regression of the dependent variable: **obstacle/loss** R = .32; R^2 = .10; F = 4.43; p = .042			
Agreeableness	.32	2.10	.042
Regression of the dependent variable: **challenge** R = .40; R^2 = .16; F = 7.37; p = .01			
Conscientiousness	–.40	–2.71	.010
Regression of the dependent variable: **harm** R = .39; R^2 = .15; F = 7.06; p = .011			
Extroversion	–,39	–2.66	.011
Regression of the dependent variable: **value** R = .45; R^2 = .20; F = 9.81; p = .003			
Conscientiousness	–.45	–3.13	.003

Discussion

Personality factors play an important role in the process of assessing, perceiving and understanding one's own illness [17, 24, 25]. Following Janowski's study [19], it was expected that individuals with high levels of neuroticism would score higher on threat, harm, and obstacle/loss scales. However, no such relationship was found in our study. Interestingly, it was noted that the higher the patients scored on neuroticism, the less likely they were to perceive their disease as a situation that they could benefit from, a result that was not obtained in the study of psoriasis patients [19]. Perhaps, this finding was influenced by other variables that were not considered in this study, or, maybe, it was the entire profile of the patients' personality structure that was responsible for this result, rather than neuroticism alone. This issue may be explored in future studies.

It was also demonstrated that conscientiousness was associated with disease-related appraisals in patients with blood cancer — the higher the level of this personality trait, the less inclined the subjects were to perceive their disease as a threat, challenge and value. Surprisingly, in our sample, conscientiousness correlated negatively with challenge and value appraisals. Given the literature data, we expected this relationship to be positive [11,19]. Perhaps, when faced with cancer, conscientious patients do not see it as a pathway that will allow them to appreciate the value of life and the difficulties they will need to deal with along the way, because it disturbs their previous sense of organization. By the same token, the fact that these persons are less inclined to see their disease as a threat does not motivate them to fight for their health and life, because it does not disturb their life balance and safety [25, 26].

The already quoted study of psoriasis patients showed that a high level of extroversion correlated with higher challenge appraisal scores [19]. However, this finding was not confirmed in the present study of patients with ALL and MM. In this group of subjects, higher extroversion scores correlated with lower harm appraisal scores. Most likely, people who have high level of extroversion do not perceive their disease as a harmful and unfair life event, because they feel that they are not left to their own devices in combating the malignancy. The ability to experience positive emotions, which characterizes extroverted patients, protects them against feeling harmed and unhappy.

One study showed that agreeableness was negatively correlated with harm and obstacle/loss appraisals [19]. In our sample, agreeableness did not correlate with harm appraisal, but it did correlate with obstacle/loss appraisal, however, the correlation was a positive one. This means that, in contrast to psoriasis patients, blood cancer patients who are characterized by a high level of agreeableness perceive their disease as an obstacle/loss. In our sample, patients with higher agreeableness scores tended to view their disease as putting up limitations and barriers

to their everyday activities. Perhaps people who are normally peaceful and have a positive attitude towards others, when faced with the disease and the related change in functioning, feel they have to "fight for what's theirs", which they find difficult [27].

When analysing the obtained results, it was decided to see what role personality played in an individual's assessment of their disease. Conscientiousness was found to explain the patients' perceptions of their disease as a risk, challenge and value. Agreeableness and extroversion, on the other hand, explained appraisals of the disease as an obstacle/loss and harm, respectively. It is worth noting that a patient's specific personality structure is a predictor that largely explains their perception of reality. It may therefore seem that people who are more extroverted or open are better adapted to the disease, while people who have a more neurotic personality are more vulnerable to the various stimuli related to their illness [10]. However, the presented study demonstrated that when the disease is severe, some of these relationships are not so clear–cut, for example, the above mentioned positive correlation between the level of agreeableness and obstacle/loss appraisals, or the negative correlation between conscientiousness and challenge or value appraisals.

Among limitations of the study a preliminary report should be mentioned, the goal of which was to define the directions of future research on the relationships between disease–related appraisals and personality, and conclusions should be viewed with caution. Secondly, a study sample was modest, and so, future investigations should involve a larger number of patients, which would also allow the use of more advanced statistical methods. Future studies should include other groups of cancer patients.

Conclusions

1. Patients who scored higher on neuroticism assess their disease as being less of a benefit to them.
2. Patients with higher extroversion level perceive their disease as being less of a harm to them.
3. The more agreeable patients are, the more inclined they are to see their disease as an obstacle/loss.
4. The more conscientiousness patients are, the less likely they are to see their disease as a threat, challenge or value.

Declaration of conflict of interests

The authors declare that there is no conflict of interest.

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