Coping with cancer: The role of different sources of psychosocial support and the personality of
patients with cancer in (mal)adaptive coping strategies

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Abstract

Objectives

Cancer is a serious event in a person's life. However, certain coping strategies in relation to selected social, emotional and personality factors appear to manage the disease.

Methods

Sources of social support were tested in cancer survivors (N = 696) using hierarchical linear regression. Selected personality variables in terms of sociodemographic, clinical, and emotional factors were used as predictors of adaptive and maladaptive coping strategies.

Results

It was found that adaptive coping strategies were more frequent in younger patients, in patients who attended cancer support groups and those with a greater level of optimism. Maladaptive coping was related to the higher level of experience of pain and sadness, neuroticism, and pessimism. The absence of a relapse and the time since the disease had been diagnosed were also important factors in coping with cancer.

Conclusions

The results point to the importance of considering various individual factors in the process of intervention to facilitate adaptive coping and to reduce maladaptive coping.

Keywords: Cancer; Coping; Psychosocial Support; Optimism; Pessimism; Neuroticism

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Coping with cancer: The role of different sources of psychosocial support and the personality of patients with cancer in (mal)adaptive coping strategies

Introduction

The psychological impact of a cancer diagnosis accompanies patients from their diagnosis, right through their treatment to being in remission (Costa et al., 2016; Michel et al., 2019). It is known that a selection of coping strategies, perceived social support and personality variables directly influence the disease at various stages of its trajectory (Nipp et al., 2017).

Coping strategies have been shown to be important variables in uncontrollable and unchangeable situations (Zoellner & Maercker, 2006; Shand et al., 2015), of which cancer is one. Cancer patients use various coping strategies to deal with this difficult situation (e.g., Boatemaa Benson et al., 2020; Toscano et al., 2020). There are two different coping strategies – adaptive and maladaptive (Grassi, et al., 2005; Wang et al., 2013). Adaptive coping strategies are related to mental well-being, a healthy lifestyle and perceived social support (Holland & Holahan, 2003). Adaptive coping also leads to good psycho-social adaptation (Heim et al., 1997), and greater feelings of meaning in life, and positive future prospects (Chen & Chang, 2012). Maladaptive strategies are related to experiencing anxiety, distress, and a lower quality of life (Jimenez-Fonseca et al., 2018). Maladaptive coping also leads to an intensification of the trauma-related symptoms of cancer (Oniszczenko & Laskowska, 2014).

Strategies of coping with cancer depend on various factors. In the terms of sociodemographic factors, it has been found that males use different coping strategies from females (Lauriola & Tomai, 2019). In addition, younger patients are more likely to use adaptive

strategies (Pereira, 2016; Mishra & Saranath, 2019) while those who have already reached old age respond more frequently with helplessness and hopelessness (Czerw et al., 2015).

From the clinical markers, the most important indicator is relapse (Johansson et al., 2011; Wang et al., 2013). Helplessness/hopelessness and a fighting spirit have been shown to be significant coping strategies in relapsing patients (Okano et. al., 2001). In the context of time elapsed from the cancer being diagnosed, adaptive coping strategies are found in patients who have been ill for a shorter time. The selection of coping strategies also depends on hospitalisation, chemotherapy, and rehabilitation (Heim et al., 1997).

Social support is one of the crucial factors in coping with the disease (Angenendt et al., 2010). When people perceive themselves as having social support, it has a positive impact at various stages following the trauma. As such, it helps to reduce the disease-related strain and stress (Prati & Pietrantonio, 2009; Schroevers et al., 2010) as well as reducing feelings of anxiety and depression (Hann et al., 2002). The perception of having social support correlates positively with adaptive strategies (Yağmur & Duman, 2016) and is a protective factor against choosing maladaptive coping strategies (Somasundaran & Devamani, 2016; Mishra & Saranath, 2019). Increased levels of social support in cancer survivors lead to more adaptive coping with cancer and a higher quality of life (Newell et al., 2002). It is also a factor affecting posttraumatic growth (Nenova et. al, 2013; Rzeszutek et al., 2017).

The preferred ways of coping with stress caused by the disease are also derived from personality dimensions (Carver et al., 2003). Thus, personality traits may be an important factor in selecting coping strategies (Langford et al., 2020). Neuroticism, a personality trait characterised by evasive tendencies and negative affectivity, tends to be associated with

maladaptive coping strategies (Bolger & Zuckerman, 1995) and other factors with a negative impact on various cancer-related processes (Bovero et al., 2020) and overall quality of life (Coker et al., 2020).

Dispositional optimism appears to be an important factor in choosing adaptive management strategies. It is mainly related to coping strategies such as combativeness or positive reassessment (Milaniak & Wilczek-Ruziczka, 2017). Patients with a higher level of optimism use more frequent adaptive coping strategies, while pessimistic patients prefer strategies that can be classified as maladaptive (Hodges & Winstanley, 2012; Lee & Mason, 2013). Dispositional optimism is also positively related to the perception of social support where optimistic patients perceive more social support (Bozo et al., 2009; He et al., 2014), experience less anxiety and have a better quality of life (De Moor et al., 2006; Gallagher et al., 2018). Cancer is a serious, unexpected and very traumatic event. By its nature, this disease not only affects a person's physical condition, but their emotional functioning as well (Macía et al., 2020). In terms of managing this, it is very important to know which factors play a role and what the relationships are between them. This can be particularly important in identifying interventions which can subsequently lead to an improved quality of life for cancer patients (Gori et al., 2021).

The aim of this study was to identify coping strategies and examine the connections between selected socio-demographic factors, pain and grief experience, various sources of social support and selected personality factors (optimism, pessimism, neuroticism). These findings have the potential to provide insights that will help cancer survivors cope with cancer.

Methods

Sample and procedure

The questionnaires were administered between July 2019 and July 2020 to cancer survivors in 4 hospitals and 5 different cancer support groups in different parts of Slovakia. This study is a part of the project “Cognitive-existential profile and specifics of post-traumatic growth in cancer survivors” (osf.io/4maz9/). Ethical approval was granted in June 2018 by the Ethical Committee at Trnava University (resolution No. 1/2018), National Cancer Institute, and management of hospitals. The research was carried out according to the Declaration of Helsinki. Participation in the study was voluntary and patients could leave the research at any stage without any consequences. Patients confirmed their participation in the study by providing informed consent. There were no questions in the questionnaire which were forced, and patients could leave a response blank in the case that they did not wish to answer. The questionnaires were administered individually or in groups. In most cases, the data collection was carried out in-person while around 100 patients took part online. There were three different versions of the questionnaire with the three questionnaire parts (measures) in a different order. This aimed to reduce the bias which can occur due to the effect order of questionnaires can have on participant responses (e.g., Chan 1991; Krosnick & Alwin, 1987). After completing the questionnaires, the participants were given a short debriefing. The inclusion criteria were being 18 or older, having been diagnosed with cancer, not having a severe mental health or physical condition and not being terminally ill – the data collection was not carried out in a palliative care unit.

Selection of Cancer Survivors

Marzorati et al. (2016) defines cancer survivorship as a process that begins at the moment of diagnosis and continues throughout their life. There was no strict selection of cancer survivors based on the stage of cancer survivorship (Mullan, 1985) nor by the specific type of diagnosis. Rather, the study aimed to catch the natural heterogeneity of cancer diagnosis in Slovakia as well as avoiding selection bias (Pedhazur & Schmelkin 1991).

Measures

Coping with cancer was measured by MiniMAC (Watson et al., 1994). MiniMAC is a self-report measure that consists of 29 items reflecting the coping styles used by cancer patients. In other words, this tool has been specifically created for measuring adjustment behaviour in cancer patients. The questionnaire is comprised of 5 subscales which are aimed at measuring the different behavioural and emotional states related to cancer: Helplessness-hopelessness ($\Omega = .95$; $\alpha = .93$); Cognitive avoidance ($\Omega = .82$; $\alpha = .75$); Fatalism ($\Omega = .57$; $\alpha = .67$); Anxious preoccupation ($\Omega = .90$; $\alpha = .86$) and Fighting spirit ($\Omega = .85$; $\alpha = .81$). The items are formulated as statements that can be related to the respondent's life. The respondent evaluates the extent to which these statements describe him/her. The statements are evaluated on a 4-point Likert scale from 1 to 4 (1-strongly disagree; 2 – disagree; 3 – agree; 4 – strongly agree). The subscales can be grouped into two domains (Anagnostopoulos et al., 2006): adaptive coping ($\Omega = .90$; $\alpha = .88$) and maladaptive coping ($\Omega = .95$; $\alpha = .94$).

The MSPSS (Multidimensional Scale of Perceived Social Support; Zimet et al., 1988) is a measure that consists of 12 items which address the perceived social support from family ($\Omega = .96$; $\alpha = .93$), friends ($\Omega = .98$; $\alpha = .96$), and significant others ($\Omega = .94$; $\alpha = .92$). The respondent

evaluates the individual statements on a 7-point Likert scale (1-strongly disagree, 7- strongly agree). A higher score indicates a higher level of perceived social support ($\Omega = .98$; $\alpha = .95$).

The LOT-R (Life Orientation Test; Scheier et al., 1994) consists of 10 items which measure dispositional optimism. In our research only uses 6 items to assess the variables: optimism and pessimism, 4 distracting items were not used. Measuring dispositional optimism as two distinct constructs better reflect the point that optimism and pessimism do not create one/single bipolar trait. Therefore, there are three items that reflect pessimism and three measuring optimism. The items are formulated as statements that are evaluated on a 5-point Likert scale from 1-5 (1- strongly agree to 5 - strongly disagree). High scores indicate low pessimism and vice versa. The resulting score for each subscale represents the level of the variable – optimism ($\Omega = .78$; $\alpha = .78$), pessimism ($\Omega = .73$; $\alpha = .73$).

Neuroticism was measured using a subscale from the BFI-2-S (Big Five Inventory-2-Short form; Halama et al., 2020). The BFI-2-S consists of 30 items reflecting 5 domains of personality. For this research, only one subscale was used which was the one aimed at measuring negative emotionality (neuroticism; $\Omega = .81$; $\alpha = .73$). The items are formulated as statements that may or may not describe a person's characteristics. The respondent evaluates the level of agreement with these statements using a 5-point Likert scale from 1-5 (1- strongly disagree to 5- strongly agree).

Simple questions, using a scale from 1 (excellent) to 10 (very poor), were also used to assess how the patients perceive psychosocial support from medical staff (e.g., physicians, nurses, etc.) and how often the patients feel sad from 1 (never) to 10 (always). The study also used the Wong–Baker Faces Pain Rating Scale to assess the level of perceived pain from 0 (doesn't hurt) to 10 (hurts a lot) (Wong & Baker, 1988).

Statistical analysis

From the total $N = 756$ patients, 60 patients were excluded due to missing data higher than 80%. In effective sample, $N = 696$ patients, 1.4% missingness were found (missingness was inspected in the measured variables). Missing data were imputed using multiple imputation (Van Buren & Groothuis-Oudshoorn, 2011) in the MICE package. Any missing sociodemographic variables, variables related to cancer and cancer treatment, and other categorical variables were not imputed (note. in the description of the sample, the true N is shown which takes the missing data in the categorical variables into account). In the items which were targeted as items necessary to input, the highest missingness was 6.18% (fourth item in the Multidimensional Social Support Scale). For the imputation, 7 imputations with 10 iterations were chosen and the PMM (Predictive Mean Matching) method was used. A descriptive analysis, reliability analysis, correlations, analysis of differences (detailed results are in the supplementary materials) and multiple hierarchical regression analysis were computed on multiple imputed objects.

Two hierarchical linear models were tested. In the first model, adaptive coping with cancer was regressed on selected sociodemographic variables (Block 1), variables related to cancer, experience of pain and sadness (Block 2), different sources of psychosocial support (Block 3) and different personality factors – pessimism, optimism and neuroticism (Block 4). In the second model, maladaptive coping with cancer was regressed on the same variables as adaptive coping. For regression coefficients plot, jtools package was used (Long, 2021).

All the results are reported as pooled estimates. The analyses were all carried out in statistical software R. The analytical code and data are available in the supplementary materials (osf.io/sdfze/).

Results

Sample

From the effective sample ($N = 696$), 463 patients with cancer were females. Most of the patients were married (57.6%) and had high school education (52.5%). The mean age of the cancer survivors was 53 ($SD = 15.44$) years old (range = 18-93). Approximately 62% of the cancer survivors had had cancer in their family history. The sample was heterogeneous from the perspective of the type of cancer (21 different types of cancer). The most prevalent diagnosis was breast cancer (211 cases), followed by colon cancer (61 cases), leukemia (48 cases) and lymphoma (47 cases). About 5% (36 cases) had two or/and more types of cancer. The exact composition of the sample by cancer type can be found in the supplementary materials. The average time since being diagnosed by cancer was 6.48 years ($SD = 7.19$). About 21% cancer survivors had had one or more cancer relapses. During data collection, there were 181 cancer survivors who were undergoing some type of treatment. Most of the cancer survivors (341 cases) had not had experience with a cancer support group and 114 cancer survivors regularly attended a cancer support group. More details can be found in the sample characteristics tables in the supplementary materials.

Descriptive analysis

Table 1 shows the descriptive statistics of the analysed variables.

Table 1

Descriptive statistics

Variable	<i>M</i>	<i>SD</i>	SE	Min	Max
Adaptive coping	38.09	7.96	0.30	13	52
Maladaptive coping	32.10	11.02	0.42	15	60
Social support (overall)	70.78	14.18	0.54	12	84
Social support (family)	23.85	5.46	0.21	4	28
Social support (friends)	22.52	5.74	0.22	4	28
Social support (significant others)	24.42	4.84	0.18	4	28
Social support (medical)	3.57	2.70	0.10	1	10
Pain	2.95	2.46	0.09	0	10
Sadness	4.34	2.44	0.09	1	10
Optimism	10.18	3.03	0.12	3	15
Pessimism	8.53	2.86	0.11	3	15
Neuroticism	16.96	4.78	0.18	6	30

Note. Due to not accurate translation of item number 13 from MiniMAC in Slovak, for the total score of maladaptive coping 15 items were used instead 16 items

Correlation analysis

Table 2 shows the correlations between the analysed variables. Adaptive coping had a weak negative relationship with all types of social support, was strongly positively related to optimism and had a weak negative relationship with sadness. Maladaptive coping had a weak negative relationship with all types of social support, a strong negative relationship with optimism, and a moderate positive relationship with neuroticism, pessimism, pain, and sadness.

Table 2

Correlations with confidence intervals

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. age	-												
2. time since diagnosis	.17*** [.10, .24]	-											
3. sadness	.004 [-.07, .08]	-.04 [-.11, .04]	-										
4. social support (M)	-.08* [-.16, -.008]	.09* [.01, .16]	.16*** [.08, .23]	-									
5. pain	.08 [.002, .15]	.02 [-.05, .10]	.51*** [.45, .56]	.15*** [.08, .23]	-								
6. neuroticism	-.03 [-.10, .05]	.02 [-.05, .10]	.47*** [.40, .52]	.13*** [.05, .20]	.29*** [.22, .36]	-							
7. adaptive coping	.03 [-.06, .12]	.10 [.03, .17]	-.08* [-.16, -.01]	.05 [-.02, .12]	-.03 [-.01, .05]	.01 [-.06, .09]	-						
8. maladaptive coping	.10* [.03, .18]	-.14** [-.21, -.06]	.33*** [.27, .40]	-.05 [-.13, .02]	.28*** [.21, .35]	.23*** [.16, .30]	-.58*** [-.63, -.53]	-					
9. optimism	.002 [-.07, .07]	.10 [.02, .17]	-.24*** [-.31, -.17]	-.02 [-.10, .05]	-.20*** [-.27, -.13]	-.23*** [-.30, -.16]	.26*** [.18, .32]	-.25*** [-.32, -.18]	-				
10. pessimism	.03 [-.04, .11]	-.03 [-.10, .04]	.20*** [.12, .27]	-.07 [-.13, .02]	.18** [.11, .25]	.21*** [.14, .28]	-.03 [-.11, -.04]	.24*** [.17, .31]	-.37*** [-.43, -.30]	-			
11. social support (Fam)	.04 [-.03, .11]	.0003 [-.08, .08]	-.15** [-.22, -.07]	-.15*** [-.22, -.07]	-.10* [-.17, -.02]	-.12** [-.19, -.04]	.13*** [.05, .20]	-.12** [-.19, -.04]	.14** [.06, .21]	-.11** [-.18, -.04]	-		
12. social support (Frie)	-.07 [-.14, .009]	-.05 [-.13, .02]	-.14** [-.21, -.06]	-.12** [-.20, -.04]	-.10* [-.17, -.02]	-.18*** [-.25, -.10]	.08* [.002, .15]	-.16*** [-.23, -.09]	.13** [.06, .20]	-.16*** [-.23, -.09]	.61*** [.56, .65]	-	
13. social support (SO)	-.04 [-.12, .04]	-.005 [-.08, .07]	-.12** [-.20, -.05]	-.06 [-.14, .01]	-.11** [-.18, -.03]	-.12** [-.20, -.05]	.11** [.04, .19]	-.15*** [-.22, -.07]	.12** [.05, .19]	-.14** [-.21, -.06]	.76*** [.73, .79]	.66*** [.61, .70]	-

Note. The values in square brackets indicate the 95% confidence interval for each correlation. * indicates $p < .05$. ** indicates $p < .01$. *** $p < .001$. social support (M) – medical, social support (Fam) – Family, social support (Frie) – Friends, social support (SO) – significant others

Regression analysis

Table 3 shows the results of the multiple hierarchical regression in the context of adaptive coping as criterion. A higher level of adaptive coping was found in younger cancer survivors, in cancer survivors who attend a cancer support group, those who had not had a cancer relapse and those with a higher level of optimism. A lower level of adaptive coping was found in those in the early phase after a cancer diagnosis. The level of adaptive coping increased after increasing time from being diagnosed.

In Table 4, the results of the multiple hierarchical regression in the context of maladaptive coping as criterion are shown. It was found that the level of maladaptive coping was lower in younger cancer survivors as well as those with a higher level of education. A higher level of maladaptive coping was found in cancer survivors who had had a relapse and with a longer time since being diagnosed. A higher level of maladaptive coping was found especially in the first months after being diagnosed. In the first few months, cancer survivors also had a lower level of adaptive coping. A higher level of maladaptive coping was also positively related to pain and sadness, neuroticism, and pessimism. In terms of pessimism, it could be seen that in very high levels of pessimism, maladaptive coping decreased. Cancer survivors who attended a cancer support group and those with higher optimism also had a lower level of maladaptive coping.

PERSONALITY FACTORS

Table 3

Regression results using adaptive coping as the criterion and sociodemographic (Block 1), cancer related (Block 2), different sources of social support (Block 3), personality factors (Block 4)

Predictor	B	SE B	β	SE β	Fit	Difference
<u>Block 1 (sociodemographic)</u>						
(Intercept)	41.17***					
Age	-0.05*	0.02	-.10	.04		
Being male	0.36	0.67	.05	.08		
Education (high school)	-0.16	1.25	-.02	.16		
Education (university)	-1.18	1.32	-.15	.17		
					R ² = .012	
					95% CI[.00,.03]	
<u>Block 2 (cancer related variables)</u>						
(Intercept)	41.94***					
Age	-0.06**	0.02	-.13	.04		
Being male	0.48	0.68	.06	.09		
Education (high school)	0.24	1.30	.03	.16		
Education (university)	-0.62	1.38	-.08	.17		
Time since diagnosis	0.15***	0.05	.14	.04		
Relapse of cancer (yes)	-3.19***	0.82	-.40	.10		
Pain	0.17	0.15	.05	.05		
Sadness	-0.25	0.16	-.08	.05		
					R ² = .053	$\Delta R^2 = .041^{***}$
					95% CI[.02,.09]	95% CI[.01, .07]
<u>Block 3 (different source of social support)</u>						
(Intercept)	36.68***					
Age	-0.07**	0.02	-.13	.04		
Being male	0.72	0.69	.09	.09		
Education (high school)	-0.16	1.32	-.02	.17		
Education (university)	-0.57	1.39	-.07	.18		
Time since diagnosis	0.12*	0.05	.11	.04		
Relapse of cancer (yes)	-3.11***	0.83	-.39	.10		
Pain	0.14	0.16	.04	.05		
Sadness	-0.25	0.16	-.08	.05		
Support (family)	0.17	0.10	.12	.07		
Support (friends)	0.002	0.08	.001	.06		
Support (significant others)	0.03	0.12	.02	.08		
Support (medical)	0.08	0.12	.03	.04		
Attending cancer support group	3.35***	0.86	.42	.11		
					R ² = .094	$\Delta R^2 = .041^{***}$
					95% CI[.05,.14]	95% CI[.01,.07]
<u>Block 4 (personality)</u>						
(Intercept)	26.72***					
Age	-0.06**	0.02	-.12	.04		
Being male	0.86	0.67	.11	.08		
Education (high school)	-0.37	1.28	-.05	.16		
Education (university)	-0.66	1.35	-.08	.17		
Time since diagnosis	0.10*	0.05	.09	.04		
Relapse of cancer (yes)	-2.37***	0.82	-.30	.10		
Pain	0.17	0.16	.05	.05		
Sadness	-0.20	0.17	-.06	.05		
Support (family)	0.13	0.10	.09	.07		
Support (friends)	-0.01	0.08	-.01	.06		
Support (significant others)	0.04	0.12	.03	.07		
Support (medical)	0.08	0.12	.03	.04		
Attending cancer support group	2.87***	0.84	.36	.11		
Neuroticism	0.08	0.08	.05	.05		
Pessimism	0.19	0.12	.07	.04		
Optimism	0.72***	0.12	.28	.05		
					R ² = .154	$\Delta R^2 = .06^{***}$
					95% CI[.10,.21]	95% CI[.03,.09]

Note. * indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$

PERSONALITY FACTORS

Table 4

Regression results using maladaptive coping as the criterion and sociodemographic (Block 1), cancer related (Block 2), different sources of social support (Block 3), personality factors (Block 4)

Predictor	B	SE B	β	SE β	Fit	Difference
<u>Block 1 (sociodemographic)</u>						
(Intercept)	32.45***					
Age	0.06*	0.03	.08	.04		
Being male	0.92	0.92	.08	.08		
Education (high school)	-3.35	1.72	-.30	.16		
Education (university)	-5.16**	1.82	-.47	.17		
					R ² = .026	
					95% CI[.01,.06]	
<u>Block 2 (cancer related variables)</u>						
(Intercept)	25.41***					
Age	0.07*	0.03	.10	.04		
Being male	0.52	0.87	.05	.08		
Education (high school)	-2.78	1.66	-.25	.15		
Education (university)	-3.93*	1.76	-.36	.16		
Time since diagnosis	-0.27***	0.06	-.17	.04		
Relapse of cancer (yes)	4.97***	1.04	.45	.09		
Pain	0.59**	0.20	.13	.04		
Sadness	1.07***	0.20	.24	.04		
					R ² = .207	$\Delta R^2 = .181^{***}$
					95% CI[.16,.28]	95% CI[.13, .23]
<u>Block 3 (different source of social support)</u>						
(Intercept)	35.22***					
Age	0.05	0.03	.08	.04		
Being male	0.13	0.85	.01	.08		
Education (high school)	-2.27	1.61	-.21	.15		
Education (university)	-3.51*	1.70	-.32	.16		
Time since diagnosis	-0.25***	0.06	-.16	.04		
Relapse of cancer (yes)	4.76***	1.01	.43	.10		
Pain	0.67***	0.19	.15	.05		
Sadness	1.07***	0.20	.24	.05		
Support (family)	0.004	0.12	.002	.06		
Support (friends)	-0.20	0.10	-.10	.05		
Support (significant others)	-0.15	0.15	-.07	.07		
Support (medical)	-0.35*	0.15	-.09	.04		
Attending cancer support group	-2.35*	1.06	-0.21	.10		
					R ² = .244	$\Delta R^2 = .037^{***}$
					95% CI[.18,.31]	95% CI[.01,.06]
<u>Block 4 (personality)</u>						
(Intercept)	30.44***					
Age	0.06*	0.03	.08	.04		
Being male	0.05	0.82	.005	.08		
Education (high school)	-2.07	1.50	-.19	.15		
Education (university)	-2.86	1.58	-.26	.16		
Time since diagnosis	-0.23***	0.06	-.15	.04		
Relapse of cancer (yes)	4.16***	1.00	.38	.10		
Pain	0.53**	0.19	.12	.04		
Sadness	0.75***	0.21	.17	.05		
Support (family)	0.01	0.12	.003	.06		
Support (friends)	-0.13	0.09	-.07	.05		
Support (significant others)	-0.13	0.14	-.06	.07		
Support (medical)	-0.28	0.15	-.07	.04		
Attending cancer support group	-2.50*	1.03	-.23	.10		
Neuroticism	0.18	0.09	.08	.04		
Pessimism	0.50**	0.15	.13	.04		
Optimism	-0.35*	0.14	-.10	.04		
					R ² = .284	$\Delta R^2 = .04^{***}$
					95% CI[.23,.35]	95% CI[.01,.07]

Note. * indicates $p < .05$. ** indicates $p < .01$. *** indicates $p < .001$

Visual comparison of regression coefficients from models can be seen in Figure 1. More detail info can be found in figures in supplementary materials.

Figure 1 *Predictors of (mal)adaptive coping with cancer*

Discussion

Understanding the preferred coping strategies in cancer survivors in the context of perceived social support and selected personality factors is important in the process of intervention with an aim to improve the quality of life of cancer survivors. Furthermore, the present study has shown that demographic and mental-health characteristics correlate with a selection of (mal)adaptive coping strategies and provide an insight into the intervention possibilities in individual cancer patients.

Ways of coping with cancer influence somatic and mental health and can change the quality of life of patients (Kang, et al., 2008; Cheng et al., 2018). In this study, a higher level of adaptive/a lower level of maladaptive coping was confirmed in younger patients. This has also been shown in other studies (Pereira, 2016; Mishra & Saranath, 2019) which found that younger patients showed higher levels of adaptive coping (Calderon et al., 2021). In contrast, older patients generally use less adaptive coping strategies when ill (Aarts et al., 2015).

Relapse of cancer was found as a significant factor of negative adaptation to cancer.

The results have shown that patients who had not relapsed demonstrated higher levels of adaptive coping. Indeed, the occurrence of a relapse correlates with a higher level of maladaptive coping strategies (Greer et al., 1979; Kosir et al., 2019). Given the long-term nature of the disease, this also poses a risk in terms of mortality (Watson et al., 2012). Maladaptive strategies were also more frequent in patients experiencing higher levels of pain and sadness. Ieraci et al. (2014) have also concluded that experiencing pain correlated more strongly with maladaptive strategies such as anxiety and helplessness/hopelessness.

The selection of coping strategies is also affected by the stage of disease and type of treatment (Vaillo et al., 2018) as well as the period following the diagnosis (Kvillemo & Bränström, 2014). In the present study, patients in the first months after diagnosis showed much lower levels of adaptive coping and higher levels of maladaptive coping. The level of maladaptive coping tended to decrease with time following the diagnosis while the level of adaptive coping tended to increase. It is possible that these findings correlate with the provision of social support. Schroevers et al. (2010) found that patients received more social support 3 months after the diagnosis, significantly predicting the positive consequences of the disease 8 years after the diagnosis. Social support is an important source in discovering the positive meaning of cancer (Pinquart et al., 2007). The results of the present study show that maladaptive coping tended to increase moderately in cancer survivors as time passed following the diagnosis. The decrease in adaptive coping was clearest between 3 and 8 months. Following this, levels started to increase again and showed a moderately increasing trend after about a year or so. Thus, it seems that time is a key variable which contributes to the selection of coping strategies in cancer survivors.

Social support is also an important factor in coping with cancer (e.g., Durá-Ferrandis et al., 2017; Salakari et al., 2017). Cancer patients showed high levels of perceived social support from their families and significant others (Tanriverd et al., 2012) which was associated with the selection of adaptive coping (Kawa, 2017). The present findings show that social support sources (family, friends, significant others) demonstrated weak or moderate positive correlations with adaptive coping and negative correlations with maladaptive coping. When personality factors were taken into account, factors related to social support did not show themselves to be significant predictors of coping strategies. In addition, the present study has shown that patients

who went to cancer support groups had higher levels of adaptive and lower levels of maladaptive coping. Gray et al. (1997) have pointed out that being involved in a support group was particularly useful for understanding and handling the short-term and long-term impact of experiencing cancer. The advantages of emotional support in a group include the sense of understanding, information and experience sharing as well as giving hope. Other authors (Weis, 2003; McGovern et al., 2008; Høybye et al., 2010; Ozdemir & Tas Arslan, 2018) have also highlighted the positive importance of cancer support groups in coping with cancer.

In the context of personality factors (neuroticism, pessimism, optimism), it was found that the rate of adaptive coping was higher in patients with a greater degree of optimism. This finding has also been confirmed by other studies (e.g., Milaniak & Wilczek-Ruziczka, 2017; Hodges & Winstanley, 2012). Support from the environment in their optimism can strengthen their search for adaptive strategies (Finck et al., 2018). On the other hand, patients with higher rates of pessimism and neuroticism showed higher rates of maladaptive coping. This has also been found by Lee & Mason (2013). Pessimism can lead the patient to negative thoughts about the course of the disease, leading to maladaptive coping strategies (Calderon et al., 2019). Likewise, neuroticism can lead to evasive behaviour that does not allow for active involvement in terms of choosing adaptive strategies. Rather, these patients choose coping strategies that avoid both cancer-related and coping-related ideas (You et al., 2017).

Limitations

The study also has some limitations which should be mentioned. First of all, it was a cross-sectional study and thus it is not possible to clarify how the coping strategies themselves change over time since the diagnosis of the disease, based on the perception of the disease and the

different forms of social support. Secondly, the sample was heterogeneous from the point of view of the different cancer types and the various times since the cancer had been diagnosed. Thirdly, cultural differences may also have contributed to the results of the study, especially from the point of view of the perception of cancer itself and the process of recovery from them, as well as the differences in the care offered and the support provided. Fourthly, other factors (other life events, financial situation, religiosity) that were not taken into account in this study may also play a role in the choice of coping strategies. A further limitation of the study is the self-reported measures, where the statements may be influenced by the patient's condition at the time of data collection.

Summary and conclusion

The findings that cancer survivors who attended a cancer support group had a higher rate of adaptive and lower rates of maladaptive coping are important findings. This is particularly the case given that almost 50% of cancer survivors in the sample had never been to one and only about 16% regularly went. It seems useful to provide more information about accessing cancer support groups and encourage cancer survivors to seek social support in these groups. When managing cancer, it is important to focus more on patients who have had a relapse and take the time since the diagnosis into account. This opens up space for being involved in a cancer support group at an early stage of the diagnosis. It would also be possible to have a separate cancer support group for patients with recurrent disease as cancer relapse brings a new situation that may again be largely unexpected. When supporting adaptive cancer management, it is important to focus on pain therapy and grief management. Psychotherapeutic interventions that could promote adaptive coping should focus on modifying negative expectations and attitudes (e.g., Pretzer & Walsh, 2001) as well as managing anxiety and reducing the tendency to worry.

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