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Coping mediates the relationship between gratitude and sense of quality of life among cancer patients

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Abstract

Introduction: Gratitude is widely known character strength that contributes to positive outcomes. The aim of this research was to confirm the relationship between gratitude and psychophysical, psychosocial, subjective, metaphysical, and global quality of life (QOL) among cancer patients. This relationship was supposed to be mediated by coping strategies and moderated by gender.

Material and methods: The participants comprised 96 hospitalized patients during 5–7-week radiotherapy, 48 women and 48 men, with breast or prostate cancer diagnosis. The following were used/measured: dispositional gratitude questionnaire, general coping strategies and specific cancer stress coping strategies, and perceived QOL (questionnaire of sense of QOL). Structural equations and bootstrap technique were used to analyse moderated mediation.

Results: Helplessness mediated the relationship between gratitude and global, psychophysical, psychosocial, and subjective QOL. Positive reinterpretation mediated the relationship between gratitude and global, psychosocial, subjective, and metaphysical QOL. Active coping mediated the relationship between gratitude and psychosocial and metaphysical QOL. The relationship between gratitude and subjective QOL was mediated by helplessness only among women.

Conclusions: The results show that there is relationship between gratitude and perceived QOL among cancer patients, which is mediated by coping. Gender moderates this mediational relationship. The results show the opportunity to improve patients' perceived QOL by interventions concentrated on gratitude enhancement and coping.

Key words: cancer, gratitude, coping, quality of life.

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INTRODUCTION

Cancer exerts an impact on quality of life (QOL) in its all aspects. There are many models of QOL, e.g. health-related QOL. As Bakas *et al*. [1] indicate, to models of QOL most used in research belong Wilson & Cleary model (16%) [2], Ferrans *et al*. model (4%) [3] and World Health Organization model (5%) [4]. One of the models that treats problem of QOL holistically is the personalistic-existential model [5], which is derived from personalistic psychology and philosophical anthropology [5]. This model includes psychophysical, psychosocial, subjective, and metaphysical dimensions of QOL. In the physical aspect of QOL, cancer causes the necessity to cope with pain, fatigue, and other side-effects of the disease and its treatment. In the psychosocial QOL, cancer leads to constraints in contact with family and friends and in professional life because of hospitalization and the perception of cancer as threatening. In psychological aspects of QOL cancer often causes anxiety, depression, and anger, and it influences the perception of oneself. In spiritual life, cancer may exert an impact on the perception of sense of life [6].

Adaptation to the difficult situation of the disease may be facilitated by the use of adaptational coping strategies. One of the best-known models of coping with cancer diagnosis includes 5 strategies of coping: helplessness-hopelessness, anxiety preoccupation, denial, avoidance, and acceptance and fighting spirit [7]. Adaptation to cancer may be increased by gratitude. There is little research of gratitude in the disease, but the relationship between gratitude and well-being among the general population has been confirmed. Gratitude correlates with well-being and with satisfaction with life [8]. Gratitude also has an impact on subjective well-being in experimental research [9]. Gratitude correlates also with psychological well-being (PWBS) in the Ryff concept [10], with autonomy, environmental mastery, personal growth, purpose in life, and self-acceptance [11]. Gratitude interventions favoured a decrease in somatic symp-

toms, duration and quality of sleep, and time dedicated to physical exercise [9, 12], an increase in parasympathetic myocardial control [13], and lower systolic blood pressure [14].

There is little research on the subject of gratitude in cancer. One study [15] included patients with metastatic breast cancer, with the aim of measuring the emotion of gratitude and its connection with social relations. Another study was conducted in a group of women with breast cancer without metastases [16], using the McCullough gratitude questionnaire [17], PWBS [10], and measuring posttraumatic growth (posttraumatic growth inventory) [18] and anxiety, depression, somatization, hostility and relaxation, satisfaction, physical well-being, and friendliness (symptom questionnaire) [19]. There were low and moderate correlations of gratitude with posttraumatic growth. Gratitude was significantly related only to one aspect of well-being, which was positive relationships. There were also low positive correlations of gratitude with relaxation and satisfaction, and low negative correlations with anxiety, depression, and hostility. Because of research showing both correlational and causal relations of gratitude and well-being [9], a search of the mechanisms of this relationship was made [14, 20, 21]. One of the hypotheses explaining the relationship of gratitude and well-being [21] is the concept of coping with stress as a mediator between gratitude and well-being. Fifty-one per cent of the relationship between gratitude and stress was mediated by coping strategies, and 11% of the relationship between gratitude and satisfaction with life was mediated by coping [20]. More grateful participants looked for instrumental and emotional support more frequently, used more strategies concentrated on problem solving such as active coping, planning, and positive reinterpretation, and more rarely used behavioural acting-out, denial, and substance abuse. Also, in Chinese research [22] the relationships between gratitude, social support, coping, and well-being were examined. Structural equation modelling showed a direct influence of gratitude on active coping style, social support, and well-being. Gratitude also exerted an indirect impact on well-being through active coping style and social support. This research shows the need for more exploration of the relationship between gratitude and well-being.

There are some gender differences in gratitude. Women score higher in gratitude than men [23]. Moreover, higher gratitude among men was related to a higher number of incorrect mental states and behaviours because men identified gratitude more with debt [23]. There are also differences in the object of gratitude among children [24]. Girls are more often grateful than boys for interpersonal relations, e.g. for family, friends, teachers, people other than family, and pets. Boys expressed more gratitude for material objects than girls. Gender also differentiates the appraisal of a favour in romantic relationships [25]. When women treated their partner's gesture as concern, it allowed the prediction of more gratitude than among men in such a situation.

To sum up, the relationships of gratitude and QOL in cancer patients should not be measured only including subjective well-being, but also in a holistic, broader perspective. Physical health, quality of social bonds, and the subjective aspect of life and spiritual life as a measure of QOL [5] may be measured in the context of gratitude and variables that explain the mechanism of the relationship between gratitude and QOL. Gender differences in gratitude suggest the need to include gender in research of gratitude and QOL among cancer patients.

MATERIAL AND METHODS

The aim of this research was to check if dispositional gratitude exerts an influence on sense of QOL among cancer patients, through mediational impact of coping with stress. The other aim was to verify if this mediational effect is moderated by gender. This could explain the mechanism of the relationship between gratitude and QOL. It was hypothesized that dispositional gratitude is positively related with QOL in the group of cancer patients, i.e. it correlates with global, psychophysical, psychosocial, subjective, and metaphysical QOL. It was also hypothesized that coping mediates this relationship, and gender moderates this meditational effect. The research obtained approval from the Ethics Committee of the John Paul II Catholic University of Lublin.

Sociodemographic data

This research included Polish patients, hospitalized during 5–7 weeks of radiotherapy. The results of 96 patients were evaluated with a diagnosis of breast or prostate cancer, aged between 31 and 79 years (M = 60.69; SD = 9.79), 48 women aged 31–78 years (M = 57.44; SD = 10.45) and 48 men aged 44–79 years (M = 63.94; SD = 7.93). In mid-adulthood (aged 30–60 years) there were 47 patients (29 women and 18 men); in late adulthood (age above 60 years) there were 49 patients (19 women and 30 men). Patients declared 1–24 months duration of the disease.

Gratitude questionnaire

The gratitude questionnaire by McCullough [17] in the Polish adaptation by Kossakowska *et al.* [26] measures dispositional gratitude. It includes 6 items with a 7-point Likert scale ("I absolutely agree" –

"I absolutely do not agree"). The reliability of the original version was high (Cronbach's α = 0.82). In the Polish adaptation the reliability was lower but still satisfactory (Cronbach's α = 0.72). One factor explains 44% of variance in this scale. The Polish version of the questionnaire correlates with adaptational aspects of personality (agreeability, extraversion, conscientiousness, spirituality, satisfaction with life, and forgiveness).

Brief-COPE

Brief-COPE is a short version of a questionnaire on strategies of coping with stress [27] in Polish adaptation by Juczyński [28]. It includes 28 items, which asses 14 strategies of coping in a 4-point Likert scale (0 – "I hardly ever do it"; 3 – "I almost always do it"). The following strategies are included: active coping, planning, positive reinterpretation, acceptance, humour, turning to religion, seeking emotional support, seeking instrumental support, dealing with something else, denial, acting-out, substance abuse, cessation of activities, and self-blaming. The half-time reliability is high and amounts to 0.86. The Guttman index is 0.87. The persistence measured after 6 weeks is satisfactory for most scales (the highest in the "turning to religion" strategy 0.94; the lowest "getting involved in something else" 0.32). Seven factors explain 66% of the variance.

Mini-MAC

The mental adjustment to cancer scale (Mini-MAC) by Watson *et al*. [29] in the Polish adaptation of Juczyński [30] contains 29 items and measures 4 strategies of coping with cancer: anxiety preoccupation, fighting spirit, helplessness/hopelessness, and positive reinterpretation. The psychometric properties of the scale are satisfactory. The reliability (internal compliance type) of the individual subscales is high: helplessness-hopelessness (0.92), fighting spirit (0.90), anxious preoccupation (0.89), and positive reinterpretation (0.87). The coefficients of constancy are as follows: helplessness-hopelessness (0.79), and anxious preoccupation (0.70); the reliability of the other strategies is slightly lower, but satisfactory (0.64–0.58).

Questionnaire of sense of quality of life

The questionnaire of sense of QOL [31] is based on personalistic and existential concepts of QOL by [5]. It is aimed at measuring subjective and multidimensional life satisfaction and well-being. There are 60 items on a 4-point Likert scale ("I absolutely do not agree" – "I absolutely agree"). The subjective QOL is measured in its 4 aspects:

- psychophysical, which means biology of human, drives, physical appearance, temperament, vitality,
- psychosocial, which include social relationships, expectations of environment, adaptation, establishing and maintaining social bonds, acceptance, one's own value,
- subjective (individuality, independence, isolation from the social background, responsibility for one's own decisions and choices, self-realization, authenticity, development of one's own interests,
- metaphysical (spirituality, realization of universal values as truth, goodness, beauty, religious experiences, sense of life).

The psychometric properties of the scale are satisfactory. Its reliability (absolute stability for adult overall score) is 0.65. The Cronbach's α internal consistency is 0.92 for the entire test. The accuracy, estimated as the agreement of the competent judges using the Kendall's W coefficient, is 0.58, 0.50, 0.67, and 0.69, respectively, for individual subscales.

Statistics

In the study, moderated mediation analysis was used (structural equation modelling and bootstrap technique). This method allows us to obtain an unstandardized β coefficient to estimate the indirect effect and 95% confidence intervals. This is a non-parametric method, in which there are no assumptions about the distribution of the variable from the population. Bootstrapping is based on multiple draws in a return sample, which allows for the generation of an empirical representation of the sample distribution and enables small sample analysis [32, 33]. The analyses were carried out using the AMOS SPSS Statistics program.

Models of moderated mediation were created in 5 steps, as shown in Tables 1 and 2.

Step 1. Check if there is moderation by comparison of an unconstrained model with a structural weights model. If moderation appears, steps 2–5 are carried out. If there is no moderation, the structural weights model is accepted, and step 5 is then carried out.

Step 2. Check which paths are moderated by building models for each path and comparing models of each path with the structural weights model.

Step 3. The final model is built, which has all paths constrained except those that were, in step 2, identified as moderated. The final model is compared with the unconstrained model. If the final model is not worse fitted to data than the unconstrained model and has satisfying goodness to fit index, the final model is accepted.

Step 4. Analysis of indirect effects to check which mediations happen in each group.

Step 5. If there is mediation, models are built with particular mediators to confirm which potential mediator is actually a mediator.

Table 1. Five steps of creating moderated mediation models

	1. Moderation: unconstrained vs. structural weights model	2. Which paths moderate	3. Final vs. unconstrained model	4. Mediation: indirect effect	5. Which paths mediate
Grat → coping → global QOL	$\chi^2(7) = 8.77$; $p = 0.270$ *CMIN* (7) = 8.77; *p* > 0.05 *CMIN/DF* = 1.25 *TLI* = 0.92 *CFI* = 0.97 *RMSEA* = 0.05 *LO90* = 0; *HI90* = 0.14	–	–	*B* = 0.22; *p* < 0.001	Active coping: *B* = 0.05; *p* = 0.074 Positive reinterpretation: *B* = 0.05; *p* = 0.037 Helplessness: *B* = 0.12; *p* = 0.017
Grat → coping → physical QOL	$\chi^2(7) = 1.48$; $p = 0.983$ *CMIN* (7) = 1.48; *p* > 0.05 *CMIN/DF* = 0.21 *TLI* = 1.42 *CFI* = 1.00 *RMSEA* = 0 *LO90* = 0; *HI90* = 0	–	–	*B* = 0.14; *p* = 0.011	Active coping: *B* = 0.005; *p* = 0.742 Positive reinterpretation: *B* = 0.003; *p* = 0.114 Helplessness: *B* = 0.11; *p* = 0.015
Grat → coping → social QOL	$\chi^2(7) = 8.03$; $p = 0.330$ *CMIN* (7) = 8.03; *p* > 0.05 *CMIN/DF* = 1.15 *TLI* = 0.96 *CFI* = 0.98 *RMSEA* = 0.04 *LO90* = 0; *HI90* = 0.14	–	–	*B* = 0.19; *p* < 0.001	Active coping: *B* = 0.06; *p* = 0.024 Positive reinterpretation: *B* = 0.05; *p* = 0.047 Helplessness: *B* = 0.08; *p* = 0.015
Grat → coping → subjective QOL	$\chi^2(7) = 18.08$; $p = 0.012$	Helplessness → subj QOL: $\chi^2(1) = 14.70$; *p* < 0.001	$\chi^2(6) = 3.38$; *p* = 0.760 *CMIN* (6) = 3.38; *p* > 0.05 *CMIN/DF* = 0.56 *TLI* = 1.16 *CFI* = 1.00 *RMSEA* = 0 *LO90* = 0; *HI90* = 0.09	Women: *B* = 0.27; *p* = 0.004 Men: *B* = 0.10; *p* = 0.037	Active coping women/men: *B* = 0.03; *p* = 0.214 Positive reinterpretation women/men: *B* = 0.04; *p* = 0.034 Hopelessness women: *B* = 0.19; *p* = 0.024 Hopelessness men: *B* = 0.04; *p* = 0.10
Grat → copingàmeta QL	$\chi^2(7) = 5.89$; $p = 0.553$ *CMIN* (7) = 5.89; *p* > 0.05 *CMIN/DF* = 0.84 *TLI* = 1.07 *CFI* = 1.00 *RMSEA* = 0 *LO90* = 0; *HI90* = 0.11	–	–	*B* = 0.17; *p* = 0.002	Active coping *B* = 0.07; *p* = 0.010 Positive reinterpretation *B* = 0.06; *p* = 0.040 Hopelessness *B* = 0.04; *p* = 0.121

CMIN – Chi-square minimum, CMIN/DF – ratio of chi-square minimum and DF, TLI – Tucker-Lewis index, CFI – comparative fit index, RMSEA – root mean square error of approximation

Study limitations

The research on the role of gratitude in the QOL of people suffering from cancer was carried out in a correlation paradigm. The applied statistical methods in the form of an analysis of structural equations allow, to some extent, for inference about the causes of the phenomena studied, but the conclusions drawn from the research should also be verified in longitudinal studies with the repeated measurement of significant variables. It would also be desirable to include the variable of social approval in the measurement research. The obtained results indicate that it would be reasonable to conduct also experimental research consisting of arousing the emotions of gratitude and verifying the type of coping strategy used.

In the context of the results obtained, there is also a question about the scope of their generalization. The research was carried out in a group of cancer patients, men and women, mostly suffering from breast or prostate cancer, who were hospitalized, undergoing radiotherapeutic treatment for causal treatment, and in middle and late adulthood. Therefore, the studies did not include outpatient or palliative treatment, or people in earlier developmental stages. Hence, the results of the study can be applied to patients treated for breast and prostate cancer. The conclusions from the research probably also apply to people suffering from other neoplasms during treatment, which have a similar course and effects on the physical and mental sphere of a person.

Table 2. Direct effects for paths of gratitude → coping → quality of life

Direct effects for paths: gratitude → coping → quality of life					
B	***p***	***B***	***p***	***B***	***p***
gratitude → helplessness		gratitude → positive reinterp		gratitude → active coping	
–0.26	0.012	0.25	0.010	0.31	0.003
helplessness → global QOL		positive reinterpr → global QOL		active coping → global QOL	
–0.49	0.003	0.23	0.023	0.10	0.281
helplessness → psychophysical QOL		positive reinterpr → psychophysical QOL		active coping → psychophysical QOL	
–0.47	0.001	0.12	0.225	–0.03	0.779
helplessness → psychosocial QOL		positive reinterpretation → psychosocial QOL		active coping → psychosocial QOL	
–0.33	0.004	0.24	0.032	0.16	0.108
helplessness → subjective QOL		positive reinterpretation → subjective QOL		active coping → subjective QOL	
–0.82 –0.17	0.002 (women) 0.149 (men)	0.14 0.14	0.199 (women) 0.199 (men)	0.07 0.07	0.497 (women) 0.497 (men)
helplessness → metaphysical QOL		positive reinterpretation → metaphysical QOL		active coping → metaphysical QOL	
–0.16	0.141	0.25	0.015	0.21	0.015
		B	*p*		
		gratitude → global QOL 0.15	0.163		
		gratitude → psychophysical QOL 0.08	0.553		
		gratitude → psychosocial QOL 0.12	0.258		
		gratitude → subjective QOL 0.05 0.05	 0.531 (women) 0.531 (men)		
		gratitude → metaphysical QOL 0.24	0.030		

QOL – quality of life

Table 3. R Pearson's correlations of gratitude and quality of life

Parameters	**Gratitude**		
	Total (*N* = 96)	**Females (*n* = 48)**	**Males (*n* = 48)**
Global QOL	0.30**	0.38**	0.27[a]
Psychophysical QOL	0.23*	0.20	0.24
Psychosocial QOL	0.24*	0.33*	0.27[a]
Subjective QOL	0.17[b]	0.30*	0.07
Metaphysical QOL	0.36***	0.47**	0.29*

QOL – quality of life

** $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, [a] $p = 0.06$, [b] $p = 0.09$*

RESULTS

The relationship between gratitude and all aspects of QOL was confirmed in *r* Pearson's correlation analysis (Tab. 3). Significant relations of gratitude and QOL allowed us to conduct analysis of moderated mediation.

To select potential mediators of the relationship between gratitude and QOL, analysis of correlation of all coping strategies with gratitude and QOL was conducted. Moderated mediation was calculated only for strategies that correlated simultaneously with gratitude and QOL – these were: helplessness-hopelessness, positive reinterpretation, and active coping.

Gratitude → coping → global QOL

In the model of the influence of gratitude on global QOL mediated by coping with gender moderation, comparison of an unconstrained model with structural weight models showed no moderation. Because no moderation was shown, a structural weights model was accepted, which is common to men and women. Coefficients of fit of the structural weights model were good. The model explained

49% of variance of global QOL in the group of women and 34% of variance among men (Tab. 1).

Analysis of direct effects showed that a higher level of gratitude explains the lower frequency of use of helplessness/hopelessness strategy (Tab. 2). More frequent use of this strategy explains the lower global QOL. A higher level of gratitude explains the more frequent use of positive reinterpretation. A higher level of positive reinterpretation explains the higher global QOL. A higher level of gratitude explains the more frequent active coping, but active coping does not explain the level of global QOL.

The indirect effect was significant, as well as the total effect ($B = 0.36$; $p = 0.005$), which shows that there is a mediation. The direct effect of gratitude on QOL was insignificant, which indicates that the mediation is full. The indirect effect of active coping was statistically insignificant, but there was a tendency towards significance. This means that active coping cannot unequivocally be stated as a mediator relationship between gratitude and global QOL. The indirect effect of positive reinterpretation was significant, the same as the effect of helplessness/hopelessness. This means that positive reinterpretation and helplessness/hopelessness mediate the relationship between gratitude and global QOL.

Gratitude → coping → psychophysical QOL

In the model of the influence of gratitude on psychophysical QOL mediated by coping with gender moderation, there was no moderation. Because no moderation was shown, a structural weights model was accepted. Coefficients of fit of the structural weights model were good. The model explained 31% of variance of psychophysical QOL in the group of women and 24% of variance among men.

A higher level of gratitude explains the lower frequency of use of helplessness/hopelessness strategy. More frequent use of this strategy explains lower psychophysical QOL. A higher level of gratitude explains the more frequent use of positive reinterpretation and active coping. A higher level of positive reinterpretation and active coping do not explain the level of psychophysical QOL.

The indirect effect was significant, but the total effect was insignificant ($B = 0.23$; $p = 0.103$), which did not show mediation unequivocally. The direct effect of gratitude on QOL indicates that the potential mediation is full.

The indirect effect of active coping and the indirect effect of positive reinterpretation indicate that these variables do not mediate the relationship between gratitude and psychophysical QOL. The indirect effect of helplessness/hopelessness indicates that this strategy mediates the relationship between gratitude and psychophysical QOL. This means that more grateful patients have a higher psychophysical QOL because of less coping through helplessness/hopelessness.

Gratitude → coping → psychosocial QOL

In the model of the influence of gratitude on psychosocial QOL mediated by coping there was no moderation. Coefficients of fit of structural weights model were good. The model explained 33% of variance of psychosocial QOL in the group of women and 25% of variance among men.

A higher level of gratitude explains the lower frequency of use of helplessness/hopelessness strategy. More frequent use of this strategy explains the lower psychosocial QOL. A higher level of gratitude explains the more frequent use of positive reinterpretation and active coping. A higher level of positive reinterpretation explains the higher psychosocial QOL, but active coping does not explain the level of psychosocial QOL.

The indirect effect and total effect ($B = 0.31$; $p < 0.001$) indicated that there is a mediation. The direct effect of gratitude on QOL indicates that the mediation is full.

The indirect effect of active coping and the indirect effect of positive reinterpretation indicate that these strategies mediate the relationship between gratitude and psychosocial QOL. More grateful patients use more active coping and positive reinterpretation, which cause a higher level of perceived QOL in its psychosocial aspect. The indirect effect of helplessness/hopelessness indicates that this strategy mediates the relationship between gratitude and psychosocial QOL. A higher level of gratitude causes a higher level of psychosocial QOL through a lower tendency to use the helplessness/hopelessness strategy.

Gratitude → coping → subjective QOL

In the model of the influence of gratitude on subjective QOL mediated by coping there was no moderation.

Releasing helplessness/hopelessness → subjective QOL path causes the model to significantly better fit to the data than the structural weights model, which means that this path is moderated.

In the next step a final model was built, in which all paths were constrained, except one, which was identified as moderated. Later, the final model was compared to the unconstrained model. The result of this comparison was insignificant, which means that final model did not fit worse to the data than the unconstrained model. In the end, final model was accepted.

The coefficients of fit of the final model were good. The model explained 59% of variance of metaphysical QOL in group of women and 9% of variance among men.

A higher level of gratitude explains the frequency of use of the helplessness/hopelessness strategy among both men and women, but more frequent use of this strategy explains the lower subjective QOL among women only. A higher level of gratitude explains the more frequent use of positive reinterpretation and active coping in both groups, but these strategies do not explain the level of subjective QOL in the women's group or in the men's group.

The indirect effect indicated that there is mediation in both groups. The direct effect of gratitude on QOL indicates that the mediation is full.

The indirect effect of active coping was insignificant in both groups, which indicates that this strategy does not mediate the relationship between gratitude and subjective QOL.

The indirect effect of positive reinterpretation was significant in both groups, which means that this strategy mediates the relationship between gratitude and subjective QOL and that gender is not a moderator of this relation. A higher level of gratitude causes more frequent use of positive reinterpretation, which enhances the subjective QOL to the same degree, regardless of gender.

The indirect effect of helplessness/hopelessness was significant among women only, which indicates that this strategy mediated the relationship between gratitude and subjective QOL in the women's group.

Gratitude → coping → metaphysical QOL

In the model of the influence of gratitude on metaphysical QOL mediated by coping there was no moderation. The coefficients of fit of the structural weights model were good. The model explained 36% of variance of metaphysical QOL in the group of women and 29% of variance among men.

The higher level of gratitude explains the lower frequency of use of the helplessness/hopelessness strategy. The more frequent use of this strategy explains the lower metaphysical QOL. The higher level of gratitude explains the more frequent use of positive reinterpretation and active coping. The higher level of these strategies explains the higher metaphysical QOL.

The indirect effect and total effect ($B = 0.41$; $p < 0.001$) indicated that there is mediation. The direct effect of gratitude on QOL indicates that the mediation is full.

The indirect effect of active coping and the indirect effect of positive reinterpretation indicate that these strategies mediate the relationship between gratitude and metaphysical QOL. More grateful patients use more active coping and positive reinterpretation, which cause a higher level of perceived QOL in its metaphysical aspect. The indirect effect of helplessness/hopelessness indicates that this strategy does not mediate the relationship between gratitude and metaphysical QOL.

DISCUSSION

The strategy of coping with stress, consisting of surrendering to the feeling of helplessness and hopelessness, turned out to be a mediator of the relationship of gratitude with the global, psychophysical, psychosocial, and subjective spheres of QOL. The helplessness/hopelessness strategy was not an intermediary variable for gratitude only in the metaphysical sphere of QOL. Among these relationships, only mediation of the relationship between gratitude and the subjective sphere of QOL turned out to be moderated by gender, and mediation occurred only in the group of women. The results show that a higher level of gratitude is conducive to a lower feeling of helplessness in illness and thus results in a higher sense of QOL in the global and psychophysical aspect, related to physical well-being and its affective components, such as pleasure and pain, with a psychosocial dimension, expressed through social adaptation, as well as the subjective dimension of women, related to self-realization and being oneself. There was no relationship between gratitude and the metaphysical sphere of QOL in terms of mediation by the helplessness/hopelessness strategy. The feeling of helplessness was not an intermediary variable in the relationship between the tendency to experience gratitude and the QOL in a metaphysical aspect related to spirituality and sense of meaning.

The helplessness/hopelessness strategy acted as a mediator of the relationship of gratitude to almost all dimensions of QOL. This means that the tendency to experience gratitude can foster a change in the interpretation of a situation as difficult and hopeless, reducing the feeling of powerlessness, and prompt one to be active. This seems to be related to perceiving the positive aspects of the situation through the use of a strategy of positive re-evaluation and active coping. It transpired that gratitude can contribute to coping with cancer through an attitude of avoiding passivity and, conversely, through reinterpretation and action. This is conducive to achieving a higher QOL. Lack of helplessness and passivity showed relationships with all spheres of QOL except the metaphysical one, while positive reinterpretation showed relationships with the subjective and metaphysical dimensions, and active coping showed re-

lationships with the psychosocial and metaphysical spheres of QOL.

The strategy of positive reinterpretation was an intermediary variable in relation to the global, subjective, and metaphysical sphere of the QOL, the same in men and women. The tendency to experience gratitude was conducive to perceiving the problem in a more favourable light, which led to a better QOL in the subjective, metaphysical, and global aspects. Active coping turned out to be a mediator of the relationship of gratitude to the psychosocial and metaphysical dimensions of QOL, regardless of gender. The reason that active coping has proven to be a mediator of the relationship of gratitude to these spheres of QOL may be due to appreciating the good things and supportive people and thus paying more attention to the positive aspects of life. It favours active problem-solving because a difficult situation is assessed as having some value and meaning, and coping with it is accompanied by other people who can be asked for help.

Demonstrating the role of coping with stress in illness as a mediator of the relationship between gratitude and QOL confirms the concept of the mechanism of the relationship between gratitude and well-being [21]. The role of coping as a mediator of the gratitude-well-being relationship [20] was also confirmed in this study.

Clinical implications

The importance of gratitude for the QOL in cancer may have application significance. In clinical practice, the diagnosis of the severity of the trait of gratitude may be used to identify people with a low tendency to experience gratitude, who may also have a lower sense of QOL, and to use psychological interventions aimed at developing this character strength to improve the QOL. The positive results of research to date on the impact of the Positive Psychotherapy Program (PPT) [34] on the treatment of depression and the impact of the trait and emotion of gratitude on well-being, as well as the results obtained in the research on the relationship between gratitude and QOL described in this article, encourage the conduction of research on a positive psychotherapy program in people suffering from cancer.

CONCLUSIONS

The results show the role of gratitude in the QOL of cancer patients and indicate a possible mechanism of this relationship, which is coping with stress. This research confirms other research on the mechanism of the relationship of gratitude and well-being, with coping as a mediator among healthy people [20]. Demonstrating the role of coping with stress in illness as a mediator of the relationship between gratitude and QOL confirms the concept of the mechanism of the relationship between gratitude and well-being [21].

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