

Life events, cognitive and behavioral coping and (medically unexplained) somatic symptoms

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Abstract

Objective: The aim of this study was to answer the questions “To what extent is there a relationship between major life events and (medically unexplained) somatic symptoms?”; “To what extent is there a relationship between cognitive and behavioral coping strategies and (medically unexplained) somatic symptoms?”; and “To what extent do cognitive and behavioral coping strategies play a moderating role?” *Methods:* 465 participants completed the Levensgebeurtenissen Vragenlijst, the Symptom CheckList-90, the Cognitive Emotion Regulation Questionnaire, and the Behavioral Emotional Regulation Questionnaire. Multiple linear regression analysis and correlation coefficients were used to investigate the (moderating) relationship between cognitive and behavioral coping strategies, major life events, and (medically unexplained) somatic symptoms. *Results:* This study shows that more life events are associated with more somatic symptoms and more (medically unexplained) somatic symptoms. The coping strategies self-blame, acceptance, rumination, catastrophizing, withdrawal, venting, and hiding away are associated with more somatic symptoms, and positive reappraisal and distraction are associated with fewer (medically unexplained) somatic symptoms. The coping strategies positive reappraisal and active approaches influence the relationship between life events and somatic symptoms, and self-blame, refocus on planning, and withdrawal influence the relationship between life events and medically unexplained somatic symptoms. *Conclusion:* The results suggests that there is a (moderating) relationship between life events, several coping strategies and (medically unexplained) somatic symptoms. These results might provide potential targets for psychotherapeutic intervention to reduce (medically unexplained) somatic symptoms after a major life event.

Introduction

Somatic symptoms are diverse, and although they may belong to different diseases, they can also be medically unexplained. Either way, they can provide many inconveniences and they can have negative consequences, both physical and psychological. When somatic symptoms can be explained, treatment may provide recovery. In case of medically unexplained somatic symptoms, a solution is more complicated. It is clear that if nothing is or can be done about somatic symptoms, negative consequences may occur concerning well-being (Gureje, Simon, Ustun, & Goldberg, 1997).

Mostly, when somatic symptoms cannot be explained, the symptoms will be considered psychological. An explanation will be sought in psychological terms, such as stress (Sapolsky, 2004). Several studies show that stress can have serious consequences. Considering a common stressor, about 70% of all people will experience at least one major life event during their lifetime (Lancaster, Melka, & Rodriguez, 2009). Only 6.8% will develop a posttraumatic stress disorder (PTSD); most of the 70% will show some sort of PTSD symptoms shortly after a traumatic life event, such as symptoms of depression or anxiety, substance abuse, and physical symptoms (Foa, Stein, & McFarlane, 2006; Lancaster et al., 2009; Pineles et al., 2011).

Converging evidence suggests an association between major life events and (medically unexplained) somatic symptoms (Foa, Stein, & McFarlane, 2006; Spitzer et al., 2009). For example, individuals who experience a traumatic life event and develop PTSD have been found to show more medically unexplained somatic symptoms than non-traumatized subjects (Andreski, Chilcoat, & Breslau, 1998; Beckham et al., 1998; Spitzer et al., 2009). Medically unexplained somatic symptoms or somatization are also called functional symptoms because the symptoms are real, such as pain, headache, fatigue, and dizziness, as well as problems with memory, attention, and concentration, but there seems to be no medical explanation (Hall, Kuzminskyte, Pedersen, Ørnbøl, & Fink, 2011).

Approximately one-third of the symptoms reported to general practitioners are medically unexplained (Steinbrecher, Koerber, Frieser, & Hiller, 2011). The medically unexplained symptoms appear to be non-specific symptoms, which occur in the general population and are persistent, disabling, and costly for society because patients with functional symptoms frequently seek medical help (Hall et al., 2011; Gawronski, Kim, & Miller, 2014). Therefore, it is important to look at factors that can reduce somatization after the experience of major life events. Since not everyone develops medically unexplained

somatic symptoms after the experience of a major life event, an explanation for the presence or absence of somatic symptoms after such a life event might be found in the stress-coping theory.

The stress-coping theory states that after a stressful life event one does two things: First appraisal, or in other words, evaluation of the meaning of the life event for that person's well-being, and after that, coping, or in other words, attempts in thought and action to manage the stressful life event (Krohne, 2001). Coping is the dynamic process of executing a response to the appraisal (Carver, Scheier, & Kumari Weintraub, 1989; Taylor & Stanton, 2007), which can be active or passive, behavioral or cognitive, problem focused or emotion focused. Possibly, one approach has a better effect on medically unexplained somatic symptoms than another.

Since coping is a dynamic process, certain coping strategies that work well for certain people in certain situations will not be helpful for all individuals in all stressful situations. However, generally speaking, problem-focussed or involvement strategies (for example, reappraisal and support seeking) are reportedly advantageous over emotion-focussed approaches (for example, avoidance and wishful thinking) regarding more favourable outcomes (Davis & Humphrey, 2012). By examining which coping strategies are associated with fewer somatization symptoms, important information may become available for the development of an effective treatment in reducing somatization symptoms.

The multidimensional concept of coping can also be divided into cognitive and behavioral regulatory processes to manage a specific stressful situation, the distinction that will be used in this study. Cognitive coping means the regulation of emotions in response to a stressful life events, through thoughts or cognitions (Doron, Thomas-Ollivier, Vachon, & Fortes-Bourbousson, 2013; Garnefski & Kraaij, 2007; Pietrzak, Harpaz-Rotem, & Southwick, 2011). Behavioral coping means actions taken after a stressful life event to deal with this life event and emotions (Hall et al., 2011; Helmreich et al., 2012).

The specific thoughts or cognitions in cognitive coping are assumed to be important for mental health (Doron et al., 2013; Taylor & Stanton, 2007). Research suggests that there can be distinguished nine cognitive coping strategies (Doron et al., 2013; Garnefski & Kraaij, 2007). *Self-blame* refers to thoughts of putting the blame for the event on oneself. *Other-blame* refers to thoughts of putting the blame for the event on the environment or someone else. *Rumination* or *focus on thoughts* refers to thinking about the feelings and thoughts associated with the negative event. *Catastrophizing* refers to thoughts of emphasizing the fright of the event. *Putting into perspective* refers to thoughts of reducing the seriousness of

the event or to thoughts of emphasizing the relativity in comparison with other events. *Positive refocusing* refers to thinking about joyful and pleasant topics instead of thinking about the actual event. *Positive reappraisal* refers to thoughts of creating a positive meaning about the event in terms of personal growth. *Acceptance* refers to thoughts of accepting the event and resigning oneself to what has happened. *Refocus on planning* refers to thinking about the steps necessary to handle the negative event (Garnefski & Kraaij, 2007, p. 142).

Research suggests that the cognitive coping strategies putting into perspective, positive refocusing, and positive reappraisal are associated with better physical and mental health outcomes and are, therefore, called adaptive (Doron et al., 2013; Garnefski et al., 2002b; Garnefski, Kraaij, & Spinhoven, 2001). The cognitive coping strategies self-blame, other-blame, rumination, and catastrophizing are suggested to be associated with poorer functioning and higher levels of depression and anxiety (Doron et al., 2013; Garnefski et al., 2001; Garnefski & Kraaij, 2006). Research is less clear about the physical and mental health outcomes of the cognitive coping strategies acceptance and refocus on planning. Kohl, Rief, and Glombiewski's (2013) research found that the cognitive coping strategy acceptance is associated with higher pain tolerance and is, therefore, seen as adaptive. Min, Yu, Lee, and Chae's (2013) research found that the cognitive coping strategy refocus on planning is associated with better outcomes, such as resilience and fewer levels of depression, and is, therefore, seen as adaptive. Other research failed to find a significant positive relationship between these styles and psychopathology (Aldao, Nolen-Hoeksema, & Schweizer, 2010; Garnefski et al., 2002b).

Behavioral coping, in other words all types of action in order to deal with life events and emotions, can be divided roughly in problem-focused and avoidant actions. Problem-focused behavioral coping can consist of taking direct action, seeking assistance, screening out other activities, and sometimes even forcing oneself to wait before acting (Carver et al., 1989). This type of coping is often used when one has the feeling of being able to do something about the stressor. Because one seeks to change the stressful situation by acting on the environment or oneself, and therefore feels he or she has control over the stressor, problem-focused behavioral coping is usually an adaptive stress reducing mechanism (Chang, Lee, Connor, Davidson, & Lai, 2006; Helmreich et al., 2012).

Avoidant behavioral coping strategies are all types of action with the aim of not having to be concerned with the stressor. This can be a wide range of actions, such as watching TV, shopping, reading, etc. (Hall et al., 2011; Helmreich et al., 2012). Usually, avoidant coping strategies are considered to be maladaptive because they do not involve problem solving.

Therefore, the stressor will not be removed or reduced, resulting in less favourable outcomes than problem-focused actions. However, there seems to be an exception in case of acute pain. Avoidant actions in order to avoid the consciousness of the acute pain can be seen as an adaptive coping strategy because they can reduce the intensity of the pain (Hall et al., 2011).

In research, several behavioral coping strategies have been distinguished. *Distraction* refers to the shift of the attentional focus away from the stressful event. In physical pain complaints, distraction is associated with a reduction in pain intensity (Kohl et al., 2013). *Withdrawal* refers to withdrawal from the stressor or others. A consistent use of withdrawal in response to many different kinds of stressful situations may lead to less favourable outcomes, such as higher depression and other symptomatology (Seiffge-Krenke, Aunola, & Nurmi, 2009). *Active approaches* refers to the problem-focused coping activities, such as solving, altering, or mentally restructuring the stressful situation. An active approach of the stressful situation may lead to better outcomes because one tries to handle the negative event itself (Baschnagel, Gudmundsdottir, Hawk Jr., & Beck, 2009). *Social support seeking* refers to social interaction with family, friends, or a special person, through which emotional concerns, instrumental aid, or information is expressed, perceived, or received. Social support seeking is seen as an adaptive manner of coping with stressful situations, which lead to better outcomes (Frison & Eggermont, 2015). *Venting* refers to the ventilation or discharging of emotional distress, such as crying, screaming, or snarling at others. Venting to oneself or others is considered to result in poorer psychosocial functioning (Brown et al., 2007). *Hiding away* referring to ignoring the negative event and pretending that nothing is going on. Because hiding away seems to be a form of avoidance, this strategy may lead to less favourable outcomes, but this has not yet been investigated.

On the basis of the literature, it is suggested that there is a relationship between life events and somatization. In addition, it is suggested that certain behavioral and/or cognitive coping strategies might have an influence on the relationship between life events and somatization. For example, certain behavioral and cognitive coping strategies may have a positive impact on the severity of (medically unexplained) somatic symptoms, where other coping strategies may have a negative impact on the severity of the symptoms.

The purpose of this study is to investigate the relationship between life events and both explained and unexplained somatic symptoms in the general Dutch population. In addition, the purpose of this study is to investigate the relationship between cognitive and behavioral coping and life events and somatization. Finally, the possible moderating role of behavioral and cognitive coping in the relationship between life events and (medically unexplained)

somatic symptoms will be investigated. This information might be a starting point for the development of an effective treatment, which could reduce (medically unexplained) somatic symptoms after a major life event.

This study will focus on the following research questions: (1) “To what extent is there a relationship between major life events and (medically unexplained) somatic symptoms in the general Dutch population?”; (2) “To what extent is there a relationship between cognitive and behavioral coping strategies and (medically unexplained) somatic symptoms in the general Dutch population?”; and (3) “To what extent do cognitive and behavioral coping strategies play a moderating role?”

Based on the literature the following hypotheses could be drawn: Hypothesis 1: It is expected that there is a positive relationship between the number of major life events and (medically unexplained) somatic symptoms in the general Dutch population. More life events are expected to be associated with more (medically unexplained) somatic symptoms.

Hypothesis 2.1: It is expected that there is a negative relationship between the use of cognitive and behavioral coping strategies putting into perspective, positive refocusing, positive reappraisal, distraction, active approaches, and social support seeking and (medically unexplained) somatic symptoms in the general Dutch population. Higher use of these coping strategies is expected to be associated with fewer (medically unexplained) somatic symptoms.

Hypothesis 2.2: It is expected that there is a positive relationship between the use of cognitive and behavioral coping strategies self-blame, other-blame, rumination, catastrophizing, withdrawal, and venting and (medically unexplained) somatic symptoms in the general Dutch population. More use of these coping strategies is expected to be associated with more (medically unexplained) somatic symptoms.

Hypothesis 3.1: It is expected that the use of cognitive coping strategies self-blame, other-blame, rumination, and catastrophizing moderate the relationship between major life events and (medically unexplained) somatic symptoms. The expectation is that the more these strategies are used, the stronger the relationship between life events and (medically unexplained) somatic symptoms.

Hypothesis 3.2: It is expected that the use of cognitive coping strategies putting into perspective, positive refocusing, and positive reappraisal moderate the relationship between major life events and (medically unexplained) somatic symptoms. The expectation is that the more these strategies are used, the weaker the relationship between life events and (medically unexplained) somatic symptoms.

Hypothesis 3.3: It is expected that the use of behavioral coping strategies distraction, active approaches, and social support seeking, moderate the relationship between major life events and (medically unexplained) somatic symptoms. The expectation is that the more these strategies are used, the weaker the relationship between life events and (medically unexplained) somatic symptoms. The use of these behavioral coping strategies after the experience of life events is expected to be associated with fewer (medically unexplained) somatic symptoms.

Hypothesis 3.4: It is expected that the use of behavioral coping strategies withdrawal, and venting moderate the relationship between major life events and (medically unexplained) somatic symptoms. The expectation is that the more these strategies are used, the stronger the relationship between life events and (medically unexplained) somatic symptoms. The use of these behavioral coping strategies after the experience of life events is expected to be associated with more (medically unexplained) somatic symptoms.

Based on the mixed results about the cognitive coping strategies acceptance and planning and the lack of information about the behavioral coping strategy hiding away, no specific hypothesis can be formulated. Therefore, exploratory research will be conducted concerning the follow question: "Do the cognitive coping strategies acceptance and planning and the behavioral coping strategy hiding away affect the relationship between life events and (medically unexplained) somatic symptoms?"

Studies regularly find sociodemographic differences in certain measures of health and the evaluation of, and dealing with, stressful events (Franks, Gold & Fiscella, 2003; Pilar, 2004). Although this study will not focus on these differences, gender, age, and education will be included as control variables in the regression analyses.

Methods

Participants

In total, 2009 registered patients from general practice Aletta in Utrecht, the Netherlands were approached. Of these, 516 registered patients started to complete the questionnaire. After checking for incomplete questionnaires, 465 participants were included for the analysis. These participants concerned 86 men (18.5%) and 379 women (81.5%), aged 18 to 67 years old (mean: 45.5 ± 13 years). Of participants, 388 had a Dutch university degree (HBO, HTS, or WO: 83.4%). Additionally, 431 participants (92.7%) reported having experienced at least one life event (mean: 4.6 ± 3.4 life events). Everyone reported at least one somatic symptom, and 93 participants reported at least one medically unexplained somatic symptom (20%).

Procedure

This study was quantitative research, using an online questionnaire. The goal was to obtain a representative sample of the general Dutch population. Participants were allowed to participate in the study if they were aged between 18 and 65 and if they had an adequate command of the Dutch language. The participants were recruited through general practitioners and an advertisement on the Internet via digi-prik.nl, a website where participants for scientific studies can be recruited.

During the study, the questionnaire was online on Qualtrics.com. Through an information letter or advertisement, the participants were guided to the Qualtrics environment. They were informed further of the investigation, such as brief instructions on how to complete the questionnaire, that the questionnaire would take about 30 minutes, and that the investigation was anonymous. The participants were also asked to sign an informed consent form. By means of this informed consent, the participants confirmed they had read and understood the information and that they gave permission to use their responses for the study. Finally, the participants were made aware of the possibility to participate in the lottery for a voucher. This consisted of the explanation of how one could participate in the lottery by providing his or her email address. It was emphasized that contact information would not be linked to the responses in the questionnaire.

Material

For the measurement of (negative) life events, the *Levensgebeurtenissen Vragenlijst* (LV; Garnefski & Kraaij, 2001) was used. This questionnaire is a checklist of 18 life events, such as “divorce of parents” or “death of loved one(s)”. The question is “do you have experienced before your 16th year of life and/or between your 16th year of life and one year ago and/or in the past year of the following life events?” On first sight, the LV seems to measure what it needs to measure, but there is no research on the validity of this questionnaire. Sum scores were calculated in four categories. All 18 life events were scored on “have experienced” (1) or “have not experienced” (0) that particular life event, which created a total sum score of 0-18, representing the number of experienced life events. In addition, the same was done for the three periods: “Before the age of 16”, “between the age of 16 and one year ago”, and “in the past year”. This method created a sum score of 0-18 for each period, representing the number of life events in that specific period.

For the measurement of (medically unexplained) somatic symptoms, the Dutch translation of the somatization subscale of the *Symptom CheckList-90* (SCL-90) was used (Arrindell & Ettema, 1986). This subscale consists of 12 items, such as “headache”, “dizziness”, and “aching muscles”. The items were answered on a 5-point Likert scale from 1 (not at all) to 5 (very much). The somatization subscale has good internal consistencies ranging from 0.74 to 0.89 (Arrindell & Ettema, 1986). The subscale of the SCL-90 was supplemented with eight study-specific items to complete the scale. Sum scores were calculated by adding the scores on the items, which created a sum score of 20-100, whereby a higher score meant that someone has had more somatic symptoms. Because the SCL-90 measures all somatic symptoms and does not differentiate between medically explained and unexplained symptoms, two versions of the SCL-90 were included in the questionnaire; one measured somatic symptoms in general, and one measured only the medically unexplained somatic symptoms. The sum score of medically unexplained somatic symptoms were calculated by adding the scores on “medically unexplained, yes (1) or no (0)”, which created a sum score of 0-20, whereby a higher score meant that someone had more medically unexplained somatic symptoms.

For the measurement of cognitive coping strategies, the *Cognitive Emotion Regulation Questionnaire* (CERQ) by Garnefski, Kraaij, and Spinhoven (2002a) was used. The CERQ is a 36-item questionnaire with nine subscales: Self-blame, other-blame, rumination, catastrophizing, putting into perspective, positive refocusing, positive reappraisal, acceptance,

and planning. The items, such as “I think that it's all my fault” and “I think about nicer things”, were measured on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). Individual subscale scores were obtained by summing the scores belonging to the particular subscale (ranging from 4 to 20). The higher the score, the more the coping strategy was used. Previous research on cognitive emotion regulation strategies has shown that all subscales have good internal consistencies ranging from 0.68 to 0.86 (Garnefski, & Kraaij, 2007).

For the measurement of behavioral coping strategies, the *Behavioral Emotional Regulation Questionnaire* (BERQ) was used (Kraaij & Garnefski, personal communication, 2015). The BERQ is a 24-items questionnaire with six subscales: Distraction, withdrawal, active approaches, seeking social support, venting, and hiding away. The questions include what one does, in general, after experiencing something unpleasant or something bad. The items, such as “I do other activities that have nothing to do with the situation” and “I try to do something about it”, were answered on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always). Individual subscale scores were obtained by summing the scores belonging to the particular subscale (ranging from 4 to 20). The higher the score, the more the coping strategy was used. The BERQ is a new questionnaire, of which the psychometric data have not yet been investigated. The reliabilities of the scales in this study have been reported.

Statistical analysis

The data from the survey was imported into the statistical analysis program IBM SPSS (version 20). First, the descriptives and reliabilities of all study variables were provided. To investigate the relationship between life events, cognitive and behavioral coping, and (medically unexplained) somatic symptoms, Pearson's product-moment correlation coefficient r was used. This coefficient is a measure of linear association between two interval or ratio variables (De Vocht, 2010; Peet, Namesnik, & Hox, 2010). The prerequisites for the calculation of r is that the data are linear and normally distributed. Linearity was checked by means of a scatter diagram. Data can approximately be regarded as normally distributed if the sample is greater than 30, which was the case in this study (De Vocht, 2010).

To investigate the direct effects and the possible moderating role of cognitive and behavioral coping strategies in the relationship between life events and (medically unexplained) somatic symptoms, a multiple linear regression analysis was used, by using the Regression procedure in SPSS. The prerequisites for the regression analysis are that data are of interval or ratio level and that data are linear and normally distributed, which was the case

in this study. In addition, the prerequisite applies that there is no multicollinearity, which means that the independent variables do not measure approximately the same. Therefore, the correlations between the independent variables should not be higher than 0.80 (De Vocht, 2010), which was not the case in this study ($r = -0.125$ to $r = 0.649$). The independent variables in this analysis were life events and the cognitive and behavioral coping strategies.

During the execution of the regression analysis, an additional check of the Tolerance and Variance Inflation Factor (VIF) was performed. The Tolerance should not be lower than 0.10 and the VIF should not exceed 10 because these values may indicate multicollinearity (Meyers, Gamst, & Guarino, 2006). Multicollinearity was not the case in this study. Both the independent variables and the possible moderator variables were standardized before the regression-analysis. To study the moderator effects of the coping strategies, interaction effects were created between life events and the coping strategies. Age, gender, and education were included in the multiple regression analysis as control variables.

To demonstrate the direct effects, method Enter was used, with the control variables entered in the first block, followed by the independent variables in the second block. To demonstrate moderating effects, methods Enter and Stepwise were used, with the control variables entered in the first block, followed by the independent variable and the hypothesized moderator variables in the second block, followed by the interaction terms (a term created by multiplying the independent and moderator z-variables) in the third block. This last block was entered with the Stepwise method.

Two conditions must be met to support the condition of moderation. First, the interaction term must be statistically significant, and second, the correlation between the independent and dependent variables must differ within different values of the hypothesized moderator. Based on the frequency distribution of the moderator variables, the coping variables were divided into three groups: Low, middle, and high values. For an improved understanding of the moderation effect(s), Pearson correlation coefficients between life events and (medically unexplained) somatic symptoms for each moderator variable were calculated.

Results

Descriptive statistics

Table 1 shows the mean, standard deviation, range, and reliability of the life events, coping, and (medically unexplained) somatic symptoms scales. The reliability of the scales self-blame, acceptance, rumination, positive refocusing, refocus on planning, positive reappraisal, putting into perspective, other-blame, distraction, withdrawal, active approaches, social support seeking, hiding away, somatic symptoms, medically unexplained somatic symptoms, and life events was good. The reliability of the scales catastrophizing and venting was sufficient.

Correlation analysis: Correlations between life events, coping, and somatisation

The correlations between life events, coping, and somatisation are shown in Table 2. Life events correlated positively and significantly with somatic symptoms and medically unexplained somatic symptoms; life events correlated positively and significantly with the cognitive coping strategies self-blame, acceptance, rumination or focus on thoughts, catastrophizing, and other-blame and negatively and significantly with putting into perspective; life events correlated positively and significantly with the behavioral coping strategies withdrawal and negatively and significantly with social support seeking.

Regarding (medically unexplained) somatic symptoms, somatic symptoms correlated positively and significantly with the cognitive coping strategies self-blame, acceptance, rumination or focus on thoughts, catastrophizing and other-blame; somatic symptoms correlated positively and significantly with the behavioral coping strategies withdrawal, venting, and hiding away and negatively and significantly with social support seeking; and medically unexplained somatic symptoms correlated positively and significantly with cognitive coping strategy rumination or focus on thoughts.

Table 1
Means, Standard Deviations (SD), Range, and Reliability (α) for each of the assessed outcome measures

	Mean	SD	Range	α
1 Self-blame	8.79	3.57	2-20	0.83
2 Acceptance	11.60	3.48	1-20	0.76
3 Rumination	10.27	3.78	1-20	0.83
4 Positive refocusing	11.02	3.77	1-20	0.86
5 Refocus on planning	13.40	3.69	2-20	0.84
6 Positive reappraisal	12.37	3.94	3-20	0.84
7 Putting into perspective	11.41	3.87	1-20	0.83
8 Catastrophizing	5.44	1.82	1-17	0.63
9 Other-blame	5.68	2.17	1-20	0.84
10 Distraction	12.03	3.30	4-20	0.86
11 Withdrawal	8.54	3.48	3-20	0.93
12 Active approaches	12.64	3.69	4-20	0.91
13 Social support seeking	11.65	3.85	4-20	0.91
14 Venting	7.78	2.27	4-16	0.58
15 Hiding away	8.32	3.62	3-20	0.89
16 Somatic symptoms	33.20	10.37	21-82	0.88
17 MUSS	0.70	2.32	0-21	0.87
18 Life events	4.61	3.38	0-19	0.71

Table 2
Pearson correlation coefficients for each of the assessed outcome measures

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1 Self-blame	0.26**	0.42**	-0.14**	0.28**	0.07	0.16**	0.19**	0.16**	-0.02	0.36**	-0.01	-0.03	0.23**	0.25**	0.27**	0.05	0.12*
2 Acceptance	-	0.37**	0.24**	0.45**	0.35**	0.32**	0.19**	0.15**	0.23**	0.19**	0.26**	0.14**	0.16**	0.10*	0.20**	0.01	0.13**
3 Rumination		-	-0.11*	0.49**	0.23**	0.03	0.38**	0.22**	-0.04	0.29**	0.24**	0.21**	0.26**	-0.01	0.32**	0.10*	0.20**
4 Positive refocusing			-	0.28**	0.41**	0.33**	-0.11*	0.08	0.51**	-0.20**	0.27**	0.14**	-0.05	-0.01	-0.07	0.01	-0.01
5 Refocus on planning				-	0.54**	0.36**	0.09*	0.22**	0.26**	0.11*	0.65**	0.36**	0.17**	-0.03	0.08	0.07	0.08
6 Positive reappraisal					-	0.46**	-0.12*	-0.05	0.30**	-0.15**	0.49**	0.27**	-0.02	-0.17**	-0.07	-0.05	-0.00
7 Putting into perspective						-	-0.14**	-0.03	0.22**	0.04	0.21**	0.11*	-0.01	0.06	-0.04	-0.03	-0.12**
8 Catastrophizing							-	0.31**	-0.08	0.23**	-0.06	-0.05	0.17**	0.15**	0.30**	0.09	0.23**
9 Other-blame								-	0.05	0.21**	0.09	0.06	0.13**	0.14**	0.17**	0.04	0.20**
10 Distraction									-	-0.13**	0.37**	0.23**	0.01	0.18**	-0.09	-0.03	0.01
11 Withdrawal										-	-0.17**	-0.31**	0.17**	0.38**	0.30**	0.09	0.19**
12 Active approaches											-	0.57**	0.16**	-0.20**	-0.07	0.02	0.02
13 Social support seeking												-	0.36**	-0.34**	-0.11*	-0.02	-0.13**
14 Venting													-	-0.08	0.13**	0.07	0.02
15 Hiding away														-	0.20**	0.06	0.06
16 Somatic symptoms															-	0.39**	0.42**
17 MUSS																-	0.13**
18 Life events																	-

Note: MUSS = medically unexplained somatic symptoms

* $p < 0.05$.

** $p < 0.01$.

Moderating analyses: Direct and moderating effects of life events and coping on somatisation

In the regression analysis aimed at analyzing the effects of life events and cognitive coping strategies on somatic symptoms, as shown in Table 3, the control variables gender, age, and education explained 4% of the variance. The cognitive coping strategies explained 31%, and with the moderating cognitive coping strategies, 32% was explained.

Significant effects were observed for life events ($\beta = 0.31$; $p < 0.001$), self-blame ($\beta = 0.14$; $p = 0.00$), acceptance ($\beta = 0.10$; $p = 0.05$), rumination ($\beta = 0.19$; $p < 0.001$), positive reappraisal ($\beta = -0.15$; $p = 0.01$), and catastrophizing ($\beta = 0.11$; $p = 0.02$) but not for positive refocusing ($\beta = 0.03$; n.s.), refocus on planning ($\beta = -0.06$; n.s.), putting into perspective ($\beta = 0.05$; n.s.), and other-blame ($\beta = 0.01$; n.s.). The interaction term life events*positive reappraisal was observed as significant ($\beta = 0.08$; $p = 0.05$). No other interaction term of life events and cognitive coping strategies on somatic symptoms was significant at all.

Explaining the interaction term life events*positive reappraisal, a positive and significant correlation was found between life events and somatic symptoms at all three values of positive reappraisal, as shown in Table 5. The highest correlation between life events and somatic symptoms was found at middle values of positive reappraisal ($r = 0.49$; $p < 0.001$). The correlation between life events and somatic symptoms at low and high values of positive reappraisal was found equal ($r = 0.38$; $p < 0.001$).

In the regression analysis aimed at analyzing the effects of life events and cognitive coping strategies on medically unexplained somatic symptoms, as shown in Table 3, the control variables gender, age, and education explained 1% of the variance and the cognitive coping strategies explained 5%, but the steps were not significant. The cognitive coping strategies with moderating effects significantly explained 8%.

Significant effects were observed for life events ($\beta = 0.12$; $p = 0.02$) and positive reappraisal ($\beta = -0.14$; $p = 0.02$) but not for self-blame ($\beta = 0.03$; $p =$ n.s.), acceptance ($\beta = -0.06$; $p =$ n.s.), rumination ($\beta = 0.06$; $p =$ n.s.), positive refocusing ($\beta = 0.06$; n.s.), refocus on planning ($\beta = 0.11$; n.s.), positive reappraisal ($\beta = -0.14$; $p =$ n.s.), putting into perspective ($\beta = 0.02$; n.s.), catastrophizing ($\beta = 0.06$; $p =$ n.s.), and other-blame ($\beta = -0.04$; n.s.). The interaction terms life events*self-blame ($\beta = -0.17$; $p = 0.00$) and life events*refocus on planning were observed as significant ($\beta = 0.16$; $p = 0.00$). None of the other interaction terms were significant.

Explaining the interaction terms life events*self-blame and life events*refocus on planning, a positive and significant correlation was found between life events and medically

unexplained somatic symptoms at low and middle values of self-blame, as shown in Table 5. The highest correlation was found at low values ($r = 0.25$; $p = 0.01$), the correlation at middle values was 0.16 ($p = 0.03$). At the high level, the correlation was also positive but not significant ($r = 0.05$; n.s.). A positive and significant correlation was also found between life events and medically unexplained somatic symptoms at the middle and high values of refocus on planning. The highest correlation was found at middle values ($r = 0.26$; $p = 0.00$), the correlation at high values was 0.19 ($p = 0.02$). At low values of the cognitive coping strategy, the correlation was negative but not significant ($r = -0.08$, n.s.).

Table 3
Predicting (medically unexplained) somatic symptoms from life events and cognitive coping strategies

Predictors	Somatic symptoms		Medically unexplained somatic symptoms	
	β	t	β	T
Step 1				
Gender	0.11	2.50*	0.08	1.73
Age	0.13	2.79**	0.06	1.20
Education	-0.11	-2.48**	-0.05	-1.01
	$R^2 = 0.04$ (F = 6.55[3,460]**)		$R^2 = 0.01$ (F = 1.77[3,460])	
Step 2				
Gender	0.08	2.01*	0.06	1.21
Age	0.09	2.18*	0.04	0.74
Education	-0.08	-1.91	-0.06	-1.22
Life events	0.31	7.26**	0.10	1.91
Self-blame	0.14	3.02**	0.00	0.04
Acceptance	0.10	2.01*	-0.06	-1.00
Rumination	0.19	3.57**	0.07	1.11
Positive refocusing	0.03	0.52	0.05	0.97
Refocus on planning	-0.07	-1.18	0.12	1.79
Positive reappraisal	-0.13	-2.47*	-0.14	-2.18*
Putting into perspective	0.04	0.78	0.01	0.16
Catastrophizing	0.11	2.35*	0.04	0.81
Other-blame	0.01	0.18	-0.03	-0.66
	$R^2 = 0.31$ (F = 15.78[13,450]**)		$R^2 = 0.05$ (F = 1.72[13,450])	
Step 3				
Gender	0.08	1.98*	0.05	1.06
Age	0.08	2.01*	0.03	0.59
Education	-0.08	-2.07*	-0.07	-1.40
Life events	0.31	7.35**	0.12	2.33*
Self-blame	0.14	3.04**	0.03	0.56
Acceptance	0.10	2.01*	-0.06	-1.01
Rumination	0.19	3.59**	0.06	0.93
Positive refocusing	0.03	0.70	0.06	1.12
Refocus on planning	-0.06	-1.07	0.11	1.74
Positive reappraisal	-0.15	-2.76**	-0.14	-2.33*
Putting into perspective	0.05	0.98	0.02	0.44
Catastrophizing	0.11	2.45*	0.06	1.02
Other-blame	0.01	0.18	-0.04	-0.71
INTXN1	0.08	1.99*		
INTXN2			-0.17	-3.44**
INTXN3			0.16	3.18**
	$R^2 = 0.32$ (F = 15.03[14,449]**)		$R^2 = 0.08$ (F = 2.62[15,448]**)	

Note: INTXN1 = interaction of life events and positive reappraisal; INTXN2 = interaction of life events and self-blame; INTXN3 = interaction of life events and refocus on planning.

* $p < 0.05$.

** $p < 0.01$.

In the regression analysis aimed at analyzing the effects of life events and behavioral coping strategies on somatic symptoms, as shown in Table 4, the control variables gender, age, and education explained 4% of the variance. The behavioral coping strategies explained 28%, and with the moderating behavioral coping strategies, 30% was explained.

Significant effects were observed for life events ($\beta = 0.36$; $p < 0.001$), distraction ($\beta = -0.11$; $p = 0.02$), withdrawal ($\beta = 0.16$; $p = 0.00$), venting ($\beta = 0.10$; $p = 0.03$), and hiding away ($\beta = 0.20$; $p < 0.001$) but not for active approaches ($\beta = -0.04$; n.s.) and social support seeking ($\beta = 0.08$; n.s.). The interaction term life events*active approaches was observed as significant ($\beta = 0.13$; $p = 0.00$). None of the other interaction terms of life events and behavioral coping strategies were significant.

Explaining the interaction term life events*active approaches, a positive and significant correlation was found at all three values of active approaches, as shown in Table 5. The highest correlation between life events and somatic symptoms was found at high values ($r = 0.53$; $p < 0.001$), followed by middle values ($r = 0.44$; $p < 0.001$) and low values ($r = 0.30$; $p = 0.00$).

In the regression analysis aimed at analyzing the effects of life events and behavioral coping strategies on medically unexplained somatic symptoms, as shown in Table 4, the control variables gender, age, and education explained 1% of the variance and the behavioral coping strategies explained 4%, but the steps were not significant. The behavioral coping strategies with moderator effects significantly explained 5% of the variance.

A significant effect was observed for life events ($\beta = 0.13$; $p = 0.01$) but not for distraction ($\beta = -0.07$; n.s.), withdrawal ($\beta = 0.05$; n.s.), active approaches ($\beta = 0.04$; n.s.), social support seeking ($\beta = 0.00$; n.s.), venting ($\beta = 0.05$; n.s.), and hiding away ($\beta = 0.08$; n.s.). The interaction term life events*withdrawal was observed as significant ($\beta = -0.12$; $p = 0.02$). No other interaction terms of life events and behavioral coping strategies were significant at all.

Explaining the interaction term life events*withdrawal, a positive and significant correlation was found between life events and medically unexplained somatic symptoms at middle values of withdrawal ($r = 0.35$; $p < 0.001$; see Table 5). At low values, the correlation was also positive but not significant ($r = 0.09$; n.s.). At high values, the correlation was negative but not significant ($r = -0.11$; n.s.).

Table 4
Predicting (medically unexplained) somatic symptoms from life events and behavioral coping strategies

Predictors	Somatic symptoms		Medically unexplained somatic symptoms	
	β	t	β	t
Step 1				
Gender	0.12	2.53*	0.08	1.74
Age	0.12	2.69**	0.06	1.20
Education	-0.11	-2.43*	-0.05	-0.99
	R ² = 0.04 (F = 6.35[3,453]**)		R ² = 0.01 (F = 1.77[3,453])	
Step 2				
Gender	0.07	1.69	0.06	1.35
Age	0.13	2.95**	0.06	1.10
Education	-0.08	-1.92	-0.04	-0.91
Life events	0.35	8.34**	0.10	2.02*
Distraction	-0.11	-2.45**	-0.06	-1.14
Withdrawal	0.14	2.90**	0.03	0.59
Active approaches	-0.03	-0.48	0.05	0.81
Social support seeking	0.06	1.08	-0.01	-0.07
Venting	0.11	2.29*	0.06	1.06
Hiding away	0.21	4.17**	0.08	1.37
	R ² = 0.28 (F = 17,60[10,446]**)		R ² = 0.04 (F = 1.74[10,446])	
Step 3				
Gender	0.06	1.51	0.06	1.25
Age	0.13	2.93**	0.05	1.01
Education	-0.08	-2.03*	-0.05	-1.05
Life events	0.36	8.62**	0.13	2.52*
Distraction	-0.11	-2.31*	-0.07	-1.22
Withdrawal	0.16	3.26**	0.05	0.94
Active approaches	-0.04	-0.68	0.04	0.71
Social support seeking	0.08	1.35	0.00	0.04
Venting	0.10	2.21*	0.05	0.98
Hiding away	0.20	4.11**	0.08	1.44
INTXN4	0.13	3.25**		
INTXN5			-0.12	-2.45*
	R ² = 0.30 (F = 17,31[11,445]**)		R ² = 0.05 (F = 2.15[11,445]*)	

Note: INTXN4 = interaction of life events and active approaches, INTXN5 = interaction of life events and withdrawal.

* $p < 0.05$.

** $p < 0.01$.

Table 5
Pearson correlation coefficients between life events and (medically unexplained) somatic symptoms for each moderator variable.

Moderator	Group		SS	MUSS
Positive reappraisal	Low	Life events	0.38**	
	Middle	Life events	0.49**	
	High	Life events	0.38**	
Active approaches	Low	Life events	0.30**	
	Middle	Life events	0.44**	
	High	Life events	0.53**	
Self-blame	Low	Life events		0.25**
	Middle	Life events		0.16*
	High	Life events		0.05
Refocus on planning	Low	Life events		-0.08
	Middle	Life events		0.26**
	High	Life events		0.19*
Withdrawal	Low	Life events		0.09
	Middle	Life events		0.35**
	High	Life events		-0.11

Note: SS = Somatic Symptoms; MUSS = medically unexplained somatic symptoms

* $p < 0.05$.

** $p < 0.01$.

In the regression analysis aimed at analyzing the effects of life events, cognitive coping strategies, and behavioral coping strategies on somatic symptoms, as shown in Table 6, the control variables gender, age, and education explained 4% of the variance. The cognitive and behavioral coping strategies explained 35%, and with the moderating cognitive and behavioral coping strategies, 36% was explained.

Significant effects were found for life events ($\beta = 0.31$; $p < 0.001$), rumination ($\beta = 0.18$; $p = 0.00$), distraction ($\beta = -0.12$; $p = 0.02$), and hiding away ($\beta = 0.17$; $p = 0.00$) but not for self-blame ($\beta = 0.08$; n.s.), acceptance ($\beta = 0.08$; n.s.), positive refocusing ($\beta = 0.08$; n.s.), refocus on planning ($\beta = -0.03$; n.s.), positive reappraisal ($\beta = -0.07$; n.s.), putting into perspective ($\beta = 0.01$; n.s.), catastrophizing ($\beta = 0.08$; n.s.), other-blame ($\beta = -0.01$; n.s.), withdrawal ($\beta = 0.06$; n.s.), active approaches ($\beta = -0.05$; n.s.), social support seeking ($\beta = 0.03$; n.s.), and venting ($\beta = 0.05$; n.s.). The interaction term life events*active approaches was again observed as significant ($\beta = 0.12$; $p = 0.00$). None of the other interaction terms of life events and cognitive or behavioral coping strategies were significant.

In the regression analysis aimed at analyzing the effects of life events, cognitive coping strategies and behavioral coping strategies on medically unexplained somatic symptoms, as shown in Table 6, the control variables gender, age, and education explained 1% of the variance and the cognitive and behavioral coping strategies explained 6%, but the steps were not significant. The cognitive and behavioral coping strategies with moderating effects explained 9% of the variance.

Significant effects were found for life events ($\beta = 0.12$; $p = 0.02$) but not for self-blame ($\beta = 0.01$; n.s.), acceptance ($\beta = -0.06$; n.s.), rumination ($\beta = 0.05$; n.s.), positive refocusing ($\beta = 0.09$; n.s.), refocus on planning ($\beta = 0.11$; n.s.), positive reappraisal ($\beta = -0.12$; n.s.), putting into perspective ($\beta = 0.02$; n.s.), catastrophizing ($\beta = 0.05$; n.s.), other-blame ($\beta = -0.05$; n.s.), distraction ($\beta = -0.07$; n.s.), withdrawal ($\beta = 0.03$; n.s.), active approaches ($\beta = 0.01$; n.s.), social support seeking ($\beta = 0.03$; n.s.), venting ($\beta = 0.03$; n.s.), and hiding away ($\beta = 0.09$; n.s.). The interaction terms life events*self-blame ($\beta = -0.18$; $p < 0.001$) and life events*refocus on planning ($\beta = 0.16$; $p = 0.00$) were again found significant. No other interaction terms of life events and cognitive or behavioral coping strategies were significant at all.

Table 6
 Predicting (medically unexplained) somatic symptoms from life events and cognitive and behavioral coping strategies

Predictors	Somatic symptoms		Medically unexplained somatic symptoms	
	β	T	β	T
Step 1				
Gender	0.12	2.53*	.08	1.74
Age	0.12	2.69**	.06	1.20
Education	-0.11	-2.43*	-.05	-.99
	R ² = 0.04 (F = 6.35[3,453]**)		R ² = 0.01 (F = 1.77[3,453])	
Step 2				
Gender	0.08	1.90	0.05	1.05
Age	0.13	3.03**	0.05	0.98
Education	-0.08	-2.07*	-0.06	-1.28
Life events	0.30	7.00**	0.10	1.86
Self-blame	0.08	1.67	-0.02	-0.40
Acceptance	0.09	1.85	-0.06	-1.08
Rumination	0.18	3.28**	0.06	0.96
Positive refocusing	0.07	1.40	0.08	1.30
Refocus on planning	-0.03	-0.39	0.12	1.53
Positive reappraisal	-0.06	-1.00	-0.11	-1.67
Putting into perspective	0.01	0.15	0.01	0.09
Catastrophizing	0.09	1.90	0.04	0.64
Other-blame	-0.01	-0.20	-0.04	-0.80
Distraction	-0.12	-2.39*	-0.07	-1.08
Withdrawal	0.05	0.90	0.01	0.21
Active approaches	-0.05	-0.72	0.02	0.22
Social support seeking	0.02	0.34	-0.01	-0.20
Venting	0.05	1.10	0.05	0.91
Hiding away	0.17	3.53**	0.07	1.23
	R ² = 0.35 (F = 12.11[19,437]**)		R ² = 0.06 (F = 1.35[19,437])	
Step 3				
Gender	0.07	1.73	0.05	0.95
Age	0.13	3.00**	0.05	0.97
Education	-0.09	-2.14*	-0.07	-1.41
Life events	0.31	7.29**	0.12	2.29*
Self-blame	0.08	1.77	0.01	0.12
Acceptance	0.08	1.79	-0.06	-1.12
Rumination	0.18	3.22**	0.05	0.73
Positive refocusing	0.08	1.53	0.09	1.46
Refocus on planning	-0.03	-0.49	0.11	1.44
Positive reappraisal	-0.07	-1.26	-0.12	-1.77
Putting into perspective	0.01	0.30	0.02	0.30
Catastrophizing	0.08	1.80	0.05	0.85
Other-blame	-0.01	-0.20	-0.05	-0.90
Distraction	-0.12	-2.31*	-0.07	-1.20
Withdrawal	0.06	1.25	0.03	0.52
Active approaches	-0.05	-0.74	0.01	0.07
Social support seeking	0.03	0.60	0.03	0.39
Venting	0.05	1.02	0.03	0.49
Hiding away	0.17	3.44**	0.09	1.49
INTXN4	0.12	2.98**		
INTXN2			-0.18	-3.51**
INTXN3			0.16	3.06**
	R ² = 0.36 (F = 12.16[20,436]**)		R ² = 0.09 (F = 2.03[21,435]**)	

Note: INTXN4 = interaction of life events and active approaches; INTXN2 = interaction of life events and self-blame; INTXN3 = interaction of life events and refocus on planning.

* $p < 0.05$.

** $p < 0.01$.

Discussion

The aim of this study was to answer the questions “To what extent is there a relationship between major life events and (medically unexplained) somatic symptoms in the general Dutch population?”; “To what extent is there a relationship between cognitive and behavioral coping strategies and (medically unexplained) somatic symptoms in the general Dutch population?”; and “To what extent do cognitive and behavioral coping strategies play a moderating role?” The results of this study suggest that there is a relationship between life events and (medically unexplained) somatic symptoms, between the cognitive and behavioral coping strategies self-blame, acceptance, rumination, catastrophizing, withdrawal, venting, hiding away, acceptance, positive reappraisal and distraction and (medically unexplained) somatic symptoms, and that the cognitive and behavioral coping strategies positive reappraisal, active approaches, self-blame, refocus on planning, and withdrawal moderates the relationship between life events and (medically unexplained) somatic symptoms.

As previously hypothesized, this study showed that more life events are associated with more somatic symptoms and more (medically unexplained) somatic symptoms. An explanation for this observed relationship could be, apart from explained somatic symptoms, such as a broken leg after an accident or a wound after an attack, the stress that is associated with the life event. As mentioned earlier, stress can have serious consequences (Foa et al., 2006; Sapolsky, 2004). This stress might be considered as a part of at least an amplifier of (medically unexplained) somatic symptoms. In that case, a treatment intervention aimed at reducing the stress of the life event could potentially lead to a reduction of the symptoms. Further research into the relationship between life events and (medically unexplained) somatic symptoms is recommended.

Regarding the relationship between cognitive and behavioral coping strategies and (medically unexplained) somatic symptoms, this study suggests, in accordance with the hypothesis, that self-blame, acceptance, rumination, catastrophizing, withdrawal, venting, and hiding away are associated with more somatic symptoms. Previous research suggested vulnerability to emotional problems when using strategies such as rumination, catastrophizing, self-blame, withdrawal, and venting compared to not using these strategies (Brown et al., 2007; Doron et al., 2013; Garnefski et al., 2001; Seiffge-Krenke et al., 2009). The results of this study indicate that there might be the same negative psychological effects on somatic symptoms as on emotional outcomes, such as depression and anxiety. Psychotherapeutic interventions aimed at reducing the use of these coping strategies could

have a positive impact on reducing somatic symptoms. Further research into the effects of psychotherapy aimed at changing maladaptive coping strategies in order to reduce somatic symptoms is recommended.

In contrast to other research, which found no significant relationship or a positive relationship between acceptance and somatic symptoms, this study suggests a negative relationship. De Gucht and Maes (2006) indicated, in their study, that a passive way of coping is associated with less favourable physical and mental health outcomes. Patients who used this way of coping considered their symptoms to be serious conditions, thought they had no control over their illnesses, and expected that their illnesses would have severe consequences. A possible explanation for the result of this study, that acceptance is associated with more physical complaints, might be in the way of accepting.

Possibly, there is a separation between truly accepting the life events or the consequences and saying one accepts them but, at the same time, experiences them passively or hopelessly, which results in more somatic symptoms. The negative relationship between hiding away and somatic symptoms could be explained by the avoidance feature of hiding away, which is considered a maladaptive way of coping when dealing with more chronic pain (Hall et al., 2011), but there is currently no scientific evidence for this explanation. Further research into both coping strategies and their effects on (medically unexplained) somatic symptoms is recommended.

As expected, this study suggests that positive reappraisal and distraction are associated with fewer somatic symptoms. Several studies reported that an optimistic view on the life event and the use of the experience for one's own growth makes one less vulnerable to emotional problems (Doron et al., 2013; Garnefski et al., 2001; Garnefski et al., 2002b). A possible explanation could be that this optimistic view also might prevent or reduce somatic symptoms. Other studies report that seeking distraction in order not to have to be concerned with the stressor is associated with a reduction in pain intensity (Hall et al., 2011; Kohl et al., 2013). Possibly, the same is true for somatic symptoms in general. Psychotherapeutic interventions aimed at encouraging the use of positive reappraisal and distraction could have beneficial effects on somatic symptoms. Further research is recommended.

Contrary to the hypothesis, no relationship was found between positive refocusing, refocus on planning, putting into perspective, other-blame, active approaches, social support seeking, and somatic symptoms. Although positive refocusing, putting into perspective, active approaches, and seeking social support are considered to have a positive influence on many physical and psychological outcomes (Baschnagel et al., 2009; Doron et al., 2013; Garnefski

et al., 2001; Frison & Eggermont, 2015), this study did not find these influences on specific somatic symptoms.

As hypothesized, positive reappraisal is also associated with fewer medically unexplained somatic symptoms. Contrary to the expectations, no other relationship was found between the cognitive and behavioral coping strategies and medically unexplained somatic symptoms. Other studies have also found few relationships between coping and medically unexplained somatic symptoms, Hall et al. (2011) only found increasing behavioral activities associated with less favourable outcomes. Considering the relatively limited scientific knowledge about medically unexplained somatic symptoms and coping strategies, further research is recommended.

Regarding the moderating role of cognitive and behavioral coping strategies in the relationship between life events and (medically unexplained) somatic symptoms, this study suggests that (1) positive reappraisal and active approaches influence the relationship between life events and somatic symptoms and (2) self-blame, refocus on planning, and withdrawal influence the relationship between life events and medically unexplained somatic symptoms. The differences within the values of all the coping strategies were too small to interpret these moderations. Further research into the moderating role of coping in the relationship between life events and (medically unexplained) somatic symptoms, in order to interpret these moderations, is recommended.

These findings support the association between major life events and (medically unexplained) somatic symptoms and the psychological aspect of coping in (medically unexplained) somatic symptoms. The findings of this study can be used in the treatment of (medically unexplained) somatic symptoms, by paying attention to one's coping strategy. By identifying negative, maladaptive coping strategies, such as rumination, catastrophizing, self-blame, withdrawal, and venting, and changing these into more helpful strategies, such as positive reappraisal, the (medically unexplained) somatic symptoms might be reduced.

In this study, a large number of respondents participated. This increases the ability to find correlations and actual determinants and to generalize the findings to the entire population. However, this study has the following limitations. There was an unequal distribution of gender and education, whereby the results could be biased: 18.5% men and 81.5% woman participated in this study, of whom 83.4% were higher educated. In the Dutch population, the male/female distribution is 49.5%/50.5%, and about 28.3% are higher educated (www.cbs.nl). Future research should try to include a more representative sample of the general population to eliminate bias.

Based on figures on the prevalence of medically unexplained somatic symptoms, approximately one-third of the symptoms reported to general practitioners are medically unexplained (Steinbrecher et al., 2011). In this study, the group of participants who reported medically unexplained somatic symptoms was a little smaller: 20%. It might be that the lack of significant relationships between coping strategies and medically unexplained somatic symptoms has something to do with this size; however, future research would do well to focus specifically on medically unexplained somatic symptoms to determine whether coping directly or indirectly influence the course of the symptoms.

Finally, drawing concrete conclusions in terms of the cause and course of medically unexplained somatic symptoms and their relationship with life events and coping strategies is not possible on the basis of this study. Therefore, longitudinal research is recommended.

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