Cognitive coping and goal adjustment in people with Peripheral Arterial Disease: Relationships with depressive symptoms

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1. Introduction

Peripheral Arterial Disease (PAD) is a common atherosclerotic disorder of the lower extremities in mature adults and seniors. A large general population study reported prevalence rates of PAD among adults aged 45 years and over of 6.4% in men and 5.1% in women, with rates dramatically increasing with advancing age in both sexes [1]. PAD is caused by arterial narrowing and is characterized by limb pain, reduced mobility, and a decreased energy level. These symptoms cause substantial impairments in other life domains, such as in the patients’ independence, abilities to perform daily activities, and social functioning. The loss of physical health and functioning impacts greatly on mental health [2]. Research has shown that the prevalence of depressive symptoms is high among people suffering from PAD, with reported prevalence rates ranging from 16% to 60% [3–6]. Although not specifically investigated in PAD patients, it is generally assumed that depressive symptoms are associated with greater physical decline, more complications and increased mortality [7–9].

Given these facts, there is a need to examine what form of psychological support might help PAD patients to endure the course of the disease process. To obtain targets for intervention, it is important to identify (modifiable) psychological risk factors associated with depressive symptoms in PAD patients. One such factor is coping. There is increasing evidence that (ongoing) psychological distress in response to chronic diseases is associated with maladaptive coping [10]. Information about the adaptiveness of specific coping strategies may therefore provide important clues for the identification of and a more effective treatment for patients with increased risk of depression. The concept of coping, however, is a very broad conceptual rubric that encompasses many behavioral and cognitive regulatory processes. In previous studies, it has been argued that attempts should be made to describe aspects of the construct, while cognitive and behavioral aspects should be clearly distinguished [11,12]. The present study focuses...
on two important coping factors that have been shown to play a vital role in the development of depression in response to a chronic disease: cognitive coping and goal adjustment.

Cognitive coping can be understood as the cognitive or mental strategies that people use to regulate their emotions associated with negative experiences [11,13,14]. A cognitive coping strategy that has repetitively been shown to be associated with higher levels of depression is rumination [15]. Rumination can be described as continuously dwelling on one’s feelings and thoughts, without taking action [16]. A ruminative way of thinking has been linked to poorer well-being in people with a chronic disease such as cancer and cardiovascular diseases [17–19]. Also, a catastrophizing way of thinking (i.e., a tendency to dwell on the worst possible outcomes) has been shown to be related to maladaptation, emotional distress and depression in the general population [11] as well as in people with chronic diseases [20,21]. In contrast, distraction from rumination and catastrophizing, in terms of thinking about pleasant issues has been associated with a better mood and enhanced problem-solving [14]. This cognitive strategy has been found to be related to lower levels of depressive symptoms, in general population samples as well as in people with a chronic disease [11,14,19,20,22–24]. To our knowledge, no previous studies are available that examined the relationships between these cognitive coping strategies and psychological adjustment in patients with PAD.

In addition, goal-related coping or the way individuals deal with the goal obstructions associated with a disease, have been shown to play an important role in the development of emotional problems after a stressful medical event. Having personal goals and striving for the attainment of these goals is believed to be of great importance for psychological well-being [25,26]. Psychological distress may arise when a person cannot attain or maintain his or her desired goals in one or more life areas, of which the most important are health, work, domestic/caring tasks, social relationships, and leisure activities. Having PAD causes goal impediments in most of these areas. Research has shown that the way people cope with such illness-related goal disturbances is strongly related to one’s level of well-being [27]. It has been suggested that, in order to restore one’s well-being in such circumstances, it may be adaptive to disengage from unattainable goals and re-engage in alternative, meaningful goals. Such goal adjustment in terms of goal disengagement and goal re-engagement has been associated with a better psychological well-being, less depression, and a greater sense of purpose in life [28]. Research results have confirmed the importance of these goal adjustment processes in people with diseases such as HIV [20] and cancer [19]. Despite the fact that goal obstructions and their impact on daily life are obvious in people with PAD, no studies have thus far been performed, that focus on the influence of goal disengagement and goal re-engagement on symptoms of depression in this group. Information on the extent to which a person is able to disengage from obstructed goals and to re-engage in new goals might be an important aid in identifying patients who have an increased risk of developing depression and in providing targets for intervention.

Therefore, the aim of the present study was to study the relationships between cognitive coping strategies, goal-related coping processes (disengagement and re-engagement) and depressive symptomatology in people diagnosed with PAD. The analyses controlled for gender, age and the severity of the physical limitations. The hypothesis was that after controlling for these variables, significant relationships would be found between depressive symptoms and the following: rumination, catastrophizing, positive refocusing, goal disengagement, and goal re-engagement (the latter three inversely).

2. Methods

2.1. Sample

Sample of this study consisted of 88 patients with PAD (66 male) ranging from 50 to 86 years (M = 67.61; S.D. = 9.84). Between 3 and 18 months before this study was conducted, all of these patients had visited the outpatient clinic of the Department of Vascular Surgery at the Leiden University Medical Center (LUMC) for treatment of their PAD. Of the respondents, 62 were married or living together with a partner, 7 were divorced, 11 were widowed, and 8 were unmarried. With regard to education level: 27 had received only primary education, 36 had completed a lower or intermediate form of secondary education, 25 had completed higher education, while 2 had not provided the requested information.

2.2. Procedure

Permission for the study was obtained from the Medical Ethics Committee. Eligible participants were all PAD patients who had visited the outpatient clinic of the Department of Vascular Surgery at the Leiden University Medical Center (LUMC) for the treatment of their Peripheral Arterial Disease in the period of 3–18 months before this study (April 2007).

A total of 173 PAD patients received a written invitation to participate in this study, which included a questionnaire. Due to confidentiality reasons, no information was available on these patients’ cognitive and/or emotional conditions. Of these patients, 6 appeared to have died, 1 did not have PAD and 8 were unreachable on the address given. Of the remaining 158, 94 returned completed questionnaires, giving a response rate of 59.5%. Of these 94 patients, 88 (93.6%) were over 50 years of age, while 6 of them were below 40. Because of the deviating age of the latter 6, these were excluded from the sample. The resulting final sample consisted of the 88 patients who were over 50 years of age. For ethical reasons, no information could be obtained on the characteristics of the patients who did not participate in the study.

2.3. Instruments

2.3.1. Physical limitations

Severity of the health-related or physical limitations was measured by the Physical Functioning Scale (PF-10), a subscale of the Medical Outcomes Study Short Form (MOS SF-36 [29]). The PF-10 consists of 10 items that assess the extent of health-related limitations in a variety of physical activities. Items are scored on a 3-point scale (1–3). A total score is obtained by summing up the ten items (10–30), with higher scores indicating more health-related limitations. Reliability and validity of the PF-10 have been supported by various studies [29]. In the present study a Cronbach’s alpha reliability coefficient of .91 was found.

2.3.2. Depression

Symptoms of depression were measured by the Hospital Anxiety and Depression Scale (HADS). The HADS is a 14-item self-report screening scale originally designed to assess the presence of anxiety and depressive states in the setting of a medical out-patient clinic [30]. The HADS contains two subscales—one for anxiety and one for depression. For the purpose of the present study, only the depression subscale was used. It consists of seven items that are each scored on a 4-point scale (0–3); a total score is obtained by summing up the seven items (0–21). Higher scores indicate higher symptoms of depression. Reliability and validity have been shown to be good [31]. In the present study, a Cronbach’s alpha reliability coefficient of .85 was found.

2.3.3. Goal disengagement and re-engagement

Goal disengagement and re-engagement were measured by the Goal Obstruction Questionnaire [20]. The GOQ measures peoples' responses when important life goals (on various domains) are no longer attainable due to a stressor, in this case having PAD. The goal disengagement subscale measures the extent to which one considers oneself able to withdraw effort and commitment from unattainable goals, while the goal re-engagement subscale measures the extent to which one considers oneself able to re-engage in alternative, meaningful goals. Both subscales consist of eight items that reflect disengagement and re-engagement efforts in four specific domains: (1) work, (2) domestic or caring tasks, (3) social relationships, and (4) leisure activities. One example item of the goal disengagement scale is: “When certain personally important goals in the domain of …(e.g., work) have become unattainable due to my disease, I am easily able to let go of these goals”. One example item of the goal re-engagement scale is: “When certain personally important goals in the domain of (e.g., work) have become unattainable due to my disease, I search for alternative goals.” The items are measured on a 5-point Likert scale, ranging from 1 (almost never) to 5 (almost always). Individual subscale scores are obtained by summing up the scores belonging to each subscale, while the goal re-engagement subscale measures the extent to which one considers oneself able to re-engage in alternative, meaningful goals.

Since the GOQ is a relatively new questionnaire, a Principal Component Analysis was performed with varimax rotation to confirm the allocation of items to subscales. Two factors were extracted, together explaining 65.5% of the variance. Loadings on the a priori factors exceeded .66. Cronbach’s alpha reliability coefficients were .90 and .94 for the goal disengagement and re-engagement scale, respectively.

2.3.4. Cognitive coping

To measure the specific cognitive coping strategies that participants used in response to their PAD, the Cognitive Emotion Regulation Questionnaire (CERQ) was used [32]. Patients were asked which specific cognitive coping strategies they used in relation to their PAD-related limitations. Three subscales were included: (1) rumination (continuously dwelling on the feelings and thoughts associated with the PAD-related limitations), (2) catastrophizing (thoughts of explicitly emphasizing the terror of the PAD-related limitations), and (3) positive refocusing (thinking about joyful and pleasant issues instead of thinking about the PAD-related limitations). Each of the three cognitive strategies was measured by two items on a 5-point Likert scale, ranging from 1 (almost never) to 5 (almost always). Individual subscale scores were obtained by summing up the scores belonging to each subscale. Research has indicated that the reliability and validity of the subscales are good [32]. In the present study, the subscales had good internal consistencies, with Cronbach’s alpha reliability coefficients of .86 for rumination, .79 for catastrophizing, and .72 for positive refocusing.

In the present study, rumination and catastrophizing were strongly correlated (.76; p < .001). To avoid problems of multicollinearity, these two scales were combined into one total score of rumination/catastrophizing that had a Cronbach’s alpha reliability coefficient of .88.

2.4. Statistical analysis

Means, standard deviations, range of scores, and Pearson correlations were calculated for all study variables. A Hierarchical Multiple Regression Analyses (MRA) was performed, with depression as the dependent variables and the other variables as the independent variables. The analyses controlled for gender, age and severity of the physical limitations. MRA was performed in two steps (method: forced entry): In the first step, the control variables were used as predictors. In the second step, the cognitive coping and goal adjustment variables were added.

3. Results

3.1. Study characteristics and correlations

Table 1 presents the means, standard deviations, and ranges of the study variables. In Table 2, Pearson correlations among all study variables are depicted. Significant positive correlations were found between physical limitations and depression, indicating that a report of more physical limitations was related to higher depression scores. Goal disengagement, goal re-engagement and positive refocusing had significantly negative correlations with depressive symptoms, indicating that higher scores on these scales were related to lower depression scores. A significant positive correlation was found between rumination/catastrophizing and depression, relating higher rumination/catastrophizing scores to higher depression scores. Correlations among the other study variables ranged from −.51 (goal disengagement and rumination/catastrophizing) to .45 (physical limitations and rumination/catastrophizing). There was no evidence of multicollinearity among the measures of cognitive and goal-related coping, for none of the correlations were higher than .80 and all tolerance statistics were higher than .70 [33].

3.2. Relationships between goal adjustment, cognitive coping and depression: MRA

In the first step of MRA (Table 3), the variables age, gender, and physical limitations were entered as independent variables. The percentage of explained variance in this step was 19% (F(3,71) = 5.39; p < .01), with only physical limitations reaching the level of significance, yielding a significant β coefficient of .40.
Table 2
Correlations among study variables (N = 88).

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<th>1</th>
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<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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</thead>
<tbody>
<tr>
<td>1. Gender</td>
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<tr>
<td>2. Age</td>
<td>.35**</td>
<td>-</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Physical limitations</td>
<td>.09</td>
<td>.32**</td>
<td>-</td>
<td></td>
<td></td>
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<tr>
<td>4. Goal disengagement</td>
<td>-.15</td>
<td>.08</td>
<td>-.07</td>
<td>-</td>
<td></td>
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<td></td>
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<tr>
<td>5. Goal re-engagement</td>
<td>-.08</td>
<td>-.29*</td>
<td>-.48***</td>
<td>.36**</td>
<td>-</td>
<td></td>
<td></td>
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<tr>
<td>6. Ruminative/catastrophizing</td>
<td>.10</td>
<td>.29**</td>
<td>.45***</td>
<td>-.51***</td>
<td>-.41***</td>
<td>-</td>
<td></td>
<td></td>
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<tr>
<td>7. Positive refocusing</td>
<td>.15</td>
<td>-.29*</td>
<td>-.48***</td>
<td>-.04</td>
<td>.01</td>
<td>-.28</td>
<td>-.11</td>
<td>-</td>
</tr>
<tr>
<td>8. Depressive symptoms</td>
<td>.29*</td>
<td>.51***</td>
<td>.60***</td>
<td>.36**</td>
<td>.25**</td>
<td>-</td>
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</table>

** p < .01. 
* p < .05.
ns = not significant.

The findings concerning ruminative and catastrophic ways of thinking correspond to findings from general population studies, which have consistently demonstrated strong relationships between these strategies and depressive symptoms [11,14–16,21]. Furthermore, these findings correspond to studies that have been conducted among other illness populations, such as cancer patients and HIV-infected people [19,20]. The present study is the first study that demonstrates that these conclusions also hold true in people with PAD.

In addition, this study’s finding concerning goal-related coping – that the pursuit of new, meaningful goals is of greater importance for psychological well-being than the letting go of unattainable goals – corresponds to findings in other samples [19,20]. It may be assumed that, whether or not a person disengages from his or her unattainable goals, the pursuit of alternative, meaningful goals is of high importance for a person’s well-being. This seems to confirm others who have noted that goal disengagement and goal reengagement should be considered as relatively independent processes [28,34].

Although both types of coping had already been linked to well-being in chronic illness samples other than PAD [17–21], this is the first study that shows that cognitive and goal-related coping strategies are also important issues in relation to the psychological health of PAD patients.

Another strong relationship was found between the severity of the reported physical limitations associated with PAD and depression. To be sure that the coping strategies added a significant amount of the variance to the depression scores over and above the amount of variance explained solely by the physical limitations, stepwise MRA was examined. In the first step, age, gender, and severity of physical limitations explained 19% of the variance in depressive symptoms. By adding cognitive coping and goal adjustment variables the explained variance increased to 48% and the effect of physical limitations became non-significant. This suggests that, in addition to the direct relationships that exist between coping variables and depression, the way of coping also seems to mediate the relationship between severity of physical limitations and depression. This underlines the importance of striving for healthy coping strategies in people with PAD.

4. Discussion and conclusions

4.1. Discussion

Given that PAD is a chronic disabling disease with decreasing quality of life and high prevalence rates of depression, this study aimed to find targets for psychological intervention to help PAD patients endure the course of the disease process. Based on this purpose, relationships were studied between cognitive coping strategies, goal-related coping processes (disengagement and re-engagement), and depressive symptomatology in mature adults and seniors diagnosed with PAD; the severity of the subjective physical limitations was controlled for. The results showed that both coping factors were important issues in relation to reports of depression, with ruminating and catastrophizing being associated with more depressive symptomatology and re-engagement in alternative goals being associated with less depressive symptomatology. This suggests that focusing on the disease in a ruminative/catastrophic manner is a maladaptive coping strategy, while coping by re-engaging in alternative, meaningful goals is an adaptive strategy.

Table 3
Hierarchical MRA of depressive symptoms.

<table>
<thead>
<tr>
<th></th>
<th>β</th>
<th>t</th>
<th>ΔR²</th>
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</thead>
<tbody>
<tr>
<td>Step 1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>.07</td>
<td>.60</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.01</td>
<td>-.09</td>
<td></td>
</tr>
<tr>
<td>Physical limitations</td>
<td>.40</td>
<td>3.55**</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.05</td>
<td>-.46</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.02</td>
<td>-.16</td>
<td></td>
</tr>
<tr>
<td>Physical limitations</td>
<td>.09</td>
<td>.77</td>
<td></td>
</tr>
<tr>
<td>Goal-related coping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal disengagement</td>
<td>.08</td>
<td>.64</td>
<td></td>
</tr>
<tr>
<td>Goal re-engagement</td>
<td>-.29</td>
<td>-.44*</td>
<td></td>
</tr>
<tr>
<td>Cognitive coping</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ruminative/catastrophizing</td>
<td>.49</td>
<td>3.97***</td>
<td></td>
</tr>
<tr>
<td>Positive refocusing</td>
<td>-.11</td>
<td>-.19</td>
<td></td>
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Full model R²

<table>
<thead>
<tr>
<th>ΔB</th>
<th>t</th>
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<tr>
<td>-.09</td>
<td>1.19</td>
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</table>

(p < .01). In the second step, the cognitive coping and goal adjustment variables were added, increasing the explained variance to 48% (F change (4,67) = 9.35; p < .001). In this step, significant β effects were found for ruminative/catastrophizing (.49; p < .001) and goal re-engagement (-.29; p < .01), while the β coefficient of physical limitations dropped to .09 (ns).

4.2. Limitations

One limitation of the study design was that the assessment of coping strategies and depressive symptomatology was made on the basis of self-reported evaluations, which may have caused some bias. Future studies should use additional forms of data-collection, such as personal interviews. Another limitation was that no information was available as to whether PAD was the patients' main diagnosis, or whether the PAD was a comorbid condition of another illness, such as diabetes.

Another point of concern is the generalizability of the study results. One example of this is that the questionnaire was only sent to patients who had visited an outpatient clinic for treatment of their PAD during the 3–18 months that preceded the study. We do not know to what extent this sample is representative of all PAD patients. In addition, the invitation to participate was sent to all of these patients, regardless of their cognitive, physical and/or emotional conditions. Due to confidentiality reasons, no information was available on the extent to which patients suffered from, for example, age-related cognitive impairments and/or severe mental disorders at the time of the invitation. Furthermore, the response rate was 59.5%; 40.5% did not send back the written questionnaire. Unfortunately, because of ethical reasons, it was not possible to obtain information on non-response reasons; cognitive, physical and emotional conditions may have influenced non-participation. Due to the fact that no information was available on non-participants, it was not possible to determine to what extent significant differences existed between those who responded and those who did not. For these reasons, the current findings remain to be confirmed in other samples.

Since cross-sectional data were used in the study, no conclusions can be drawn about directions of influence. We are unable to determine whether rumination/catastrophizing and/or lack of goal re-engagement lead to depression, or whether the reverse is true. Furthermore, it is important to acknowledge that in the present design the reported coping and goal adjustment strategies may be confounded with the reporting of depressive symptomatology. On the basis of the present study, we are unable to answer questions such as whether rumination/catastrophizing or lack of goal re-engagement actually reflect constructs that are separate from depression, or whether they are an element of depression.

Longitudinal studies are needed to clarify the meaning and directions of these associations. Nevertheless, regardless of the directions of influence, this study shows that rumination/catastrophizing and depression, as well as goal adjustment capabilities and depression are related issues. This suggests that both issues should play an important role in theoretical models as well as in intervention strategies.

4.3. Implications for theory

A major motive underlying this research was the identification of risk factors and protective factors associated with the development and continuation of emotional problems in response to a chronic disease such as PAD. The present study confirms that a ruminative/catastrophizing coping style might be such a risk factor. A novel element in this study was the inclusion of goal disengagement and goal re-engagement coping strategies. The results suggest that especially goal re-engagement – putting effort towards alternative, meaningful goals – might function as an important protective factor against the development of emotional problems in response to the disease.

Although the study has shortcomings and should be confirmed in other illness populations as well as with other designs, the results teach us that both concepts of cognitive coping and goal-related coping are likely to enhance our understanding of the process of psychological adjustment to a chronic impairing illness such as PAD. This, in turn, teaches us that these concepts should be included in theoretical stress-coping models that are designed to explain depressive symptoms in response to a chronic impairing disease.

4.4. Practice implications

The findings support the suggestion that improvements in ways of coping are likely to reduce the level or risk of depressive symptomatology. This confirms the need for specific intervention programs that bring about effective changes in the coping strategies of people suffering from PAD. The main components of such programs should be (1) teaching patients to decrease a ruminative and catastrophic way of thinking in response to their disabilities and (2) actively assisting patients in their efforts to find alternative, meaningful goals when the pursuit of existing goals has become obstructed by the disease. Studies in other illness populations have already shown positive results of coping-effectiveness training in improving psychological health [35,36]. Future studies should examine whether such programs also have an effect in people with PAD.

4.5. Conclusions

In conclusion, the present study was the first study that examined the joint influence of cognitive coping and goal-related coping on depressive symptoms in PAD patients. A style of rumination/catastrophizing was shown to be related to more symptoms of depression and was therefore considered to be a maladaptive coping strategy. In addition, re-engagement in alternative, meaningful goals was related to less depression and was considered an adaptive coping strategy. Further studies are necessary to confirm these relationships; these studies should use prospective designs and forms of data collection other than self-report. Nevertheless, the results of this study carry important implications for the focus and content of intervention and prevention of mental health problems in patients with PAD.

References