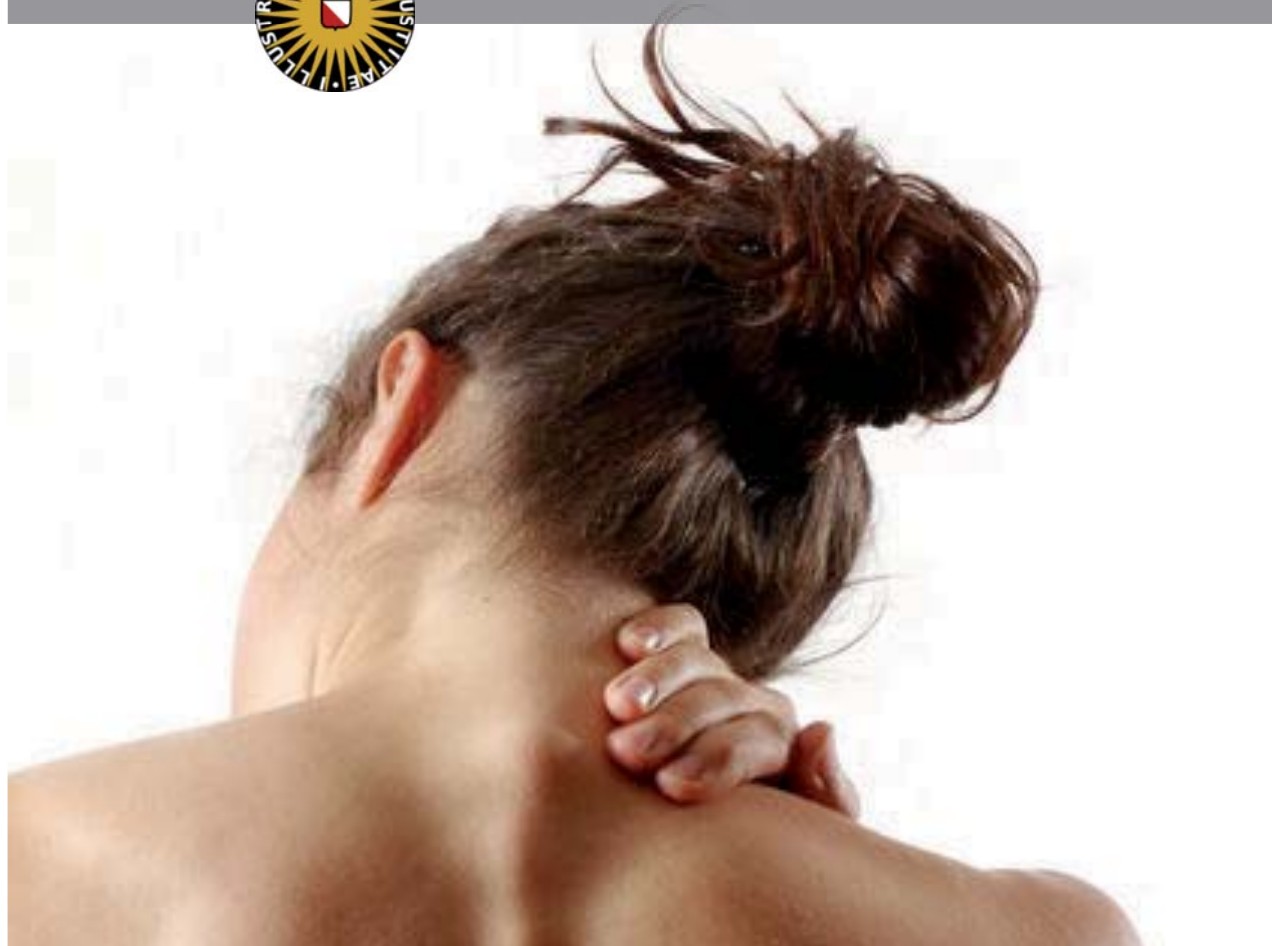


# Master thesis clinical and health psychology

Utrecht University



## **The effect of abnormal attachment, alexithymia, and trauma on the relation between medically unexplained symptoms and negative affect in tertiary care psychosomatic patients**

**Student:** Bsc. C.P. Schöls  
**Mentor:** Dr. Ing. J.H. Houtveen  
**Date:** Juli 2012



In cooperation with [Altrecht Psychosomatics](#)



## **Foreword**

The writing of this thesis has been an interesting journey. After ten months of article gathering, reading, writing, re-writing, analysing and some more writing, I proudly present to you my master thesis for clinical and health psychology. The making of this thesis and especially the gathering and structuring of the endless sources of information has thought me a lot about the essence of doing scientific research. Although there have been multiple holdups on the finishing of this report, I worked on it with great pleasure. With this thesis I truly hope that I have made a contribution, however small, to the field of knowledge on psychosomatic problems.

For making the writing of this thesis possible, I would like to express my gratitude to multiple persons. First, I would like to thank my mentor, Dr. Jan Houtveen, for helping me find my way through the never-ending quantity of literature, for teaching me how to structure an article, and for not giving up the faith, even after periods of prolonged radio silence. Second, I would like to thank Altrecht Psychosomatics, for allowing me to work with their data, and introducing me to the working field of psychosomatic patients. The experiencing of the National Congress of Medically Unexplained Symptoms was an impressive one and the keynotes gave me new inspiration to continue writing. Third, I would like to thank my parents, for supporting me in my studies and making it all financially possible. And last, I would like to thank my partner, Jeroen, for listening to my continuous stream of frustrations, discoveries, and enthusiasms, and occasionally rescuing my work from computer malfunctioning. Thank you all.

I hope you will enjoy reading this master thesis. For comments or questions feel free to contact me by mail: [c.p.schols@students.uu.nl](mailto:c.p.schols@students.uu.nl).

Karlijn Schöls

Sunday, 8 July 2012



## Summary

*Objective:* This study focuses on the effects of alexithymia, abnormal attachment, and trauma on the relation of medically unexplained symptoms (MUS) and negative affect (NA). There is a general consensus in the literature that NA and MUS are positively related. A higher prevalence of alexithymia, abnormal attachment and trauma has been proposed in psychosomatic patients. It has been suggested that alexithymia, abnormal attachment and trauma have a potential influence on MUS and NA. For this study we proposed the following hypotheses: (1) MUS and NA are positively related, (2) alexithymia and abnormal attachment will negatively influence the relation of MUS and NA due to the underreporting of NA, and (3) trauma will strengthen the relation of MUS and NA. *Methods:* A total of 338 tertiary care psychosomatic patients completed self-report measures of somatic complaints, symptoms of anxiety, depression, alexithymia, abnormal attachment and trauma. Subgroups were formed for high and low scores on alexithymia, abnormal attachment, and trauma, as well as subgroups for patients who met criteria for type I or type II alexithymia. *Results:* Correlation analyses showed that MUS and NA were significantly positively correlated and that this correlation weakened for high scores of abnormal attachment, and was non significant for high scores on trauma or patients with type II alexithymia. Furthermore, interaction effects of type II alexithymia, and high scores on abnormal attachment and trauma with NA, showed to be significant negative predictors of MUS. *Conclusion:* MUS and NA are related in the most severe patients sample. Type II alexithymia, abnormal attachment, and trauma influence this relationship. Therefore, moderating effects have been established. No mediating effects were found.

## Samenvatting

*Doel:* In dit onderzoek is gekeken naar het effect van alexithymie, onveilige hechting en trauma op de relatie van medische onverklaarde klachten (MUS) en negatief affect (NA). Er is een algemene consensus in de literatuur dat er een positief verband bestaat tussen MUS en NA. Alexithymie, onveilige hechting en trauma worden frequent gerapporteerd door patiënten met psychosomatische klachten. Daarnaast is het gesuggereerd dat alexithymie, onveilige hechting en trauma invloed kunnen hebben op MUS en NA. Voor dit onderzoek zijn de volgende hypothesen opgesteld: (1) MUS en NA zijn positief gecorreleerd, (2) alexithymie en onveilige hechting hebben een negatieve invloed op de relatie van MUS en NA en (3) trauma zal de relatie tussen MUS en NA versterken. *Methoden:* 338 derdelijns psychosomatische patiënten hebben zelfrapportagevragenlijsten ingevuld voor somatische klachten, symptomen van angst en depressie, alexithymie, onveilige hechting en trauma. Vervolgens werden ze onderverdeeld in subgroepen voor hoge en lage scores. Daarnaast werden er twee subgroepen gemaakt voor patiënten die voldeden aan de criteria van type I of type II alexithymie. *Resultaten:* Correlatieanalyses toonden aan dat MUS en NA positief zijn gecorreleerd, dat deze relatie voor hoge scores op onveilige hechting zwakker is en voor hoge scores op trauma en bij patiënten met type II alexithymie zelfs non-significant bleek. Daarnaast bleken de interactie effecten van type II alexithymie en hoge scores op onveilige hechting en trauma met NA significante negatieve voorspellers van MUS. *Conclusie:* MUS en NA zijn positief gecorreleerd voor de meest zware patiëntgroep. Daarnaast beïnvloedden type II alexithymie, onveilige hechting en trauma deze relatie. Er zijn daarmee modererende effecten, maar geen mediërende effecten gevonden.



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**Overview**

This master thesis consists of a quantitative cross-sectional study on tertiary care psychosomatic patients. The origin, as the continuation of, medically unexplained symptoms (MUS) still remains unclear, whereas the costs on society and psychological distress on patients remains (Rolfe, 2011). Previous research has indicated that negative emotions can play an important role in MUS (Henningsen, Zimmerman & Sattel, 2003; Watson & Pennebaker, 1989). However, the sample populations often consist of students or patients in primary care. This research focuses on the most severe patients group, psychosomatic patients who are in tertiary specialized care. The confirmation of previous findings will strengthen the presumed relation between negative emotions and MUS. Furthermore, since little is known about the moderating and mediating factors on this relation of negative emotions and MUS, this study will focus on the effects of abnormal attachment, alexithymia and trauma. These are all factors that influence the experience of emotions or can cause problems with affect regulation (Deary, Scott & Wilson, 1997; Fonagy & Target, 2006; Van den Berg, Grievink, Yzermans & Lebet, 2005).

This study is of interest for researchers involved in psychosomatic, emotional or psychological research, doctors involved in treatment of psychosomatic patients, psychologists, students, and all other who are interested in the relation of negative emotions and bodily complaints. This thesis consists of a theoretical introduction on psychosomatic complaints and previous findings on these complaints and negative emotions, followed by a proposed model, a description of the methods, results, discussion on the findings, and an overall conclusion.



## Introduction

Medically unexplained symptoms (MUS) can be defined as physical symptoms that cannot be explained by objectively observable abnormalities in the body, a necessity for diagnosing a disease (Rolfe, 2011; Wessely, Nimnuan & Sharpe, 1999). Although no organic explanation can be found, symptoms can be quite severe and disabling (Nimnuan, Hotopf & Wessely, 2001). MUS have been given various names, such as: somatisation, somatoform disorders, and functional somatic symptoms (Wessely et al., 1999). According to Rolfe (2011) MUS can be divided into three main types of complaint: pain of a specific location, functional disturbance in a particular organ, and disorders related to fatigue and exhaustion. Patients with MUS often have multiple symptoms, which can be ascribed to various medically unexplained syndromes (Rolfe, 2011; Wessely et al., 1999). Most well known syndromes are: fibromyalgia, irritable bowel syndrome, and chronic fatigue syndrome (Rolfe, 2011).

MUS are a major health issue, for it is thought that up to a quarter of primary care consultations and up to half of secondary care consultations are due to MUS (Rolfe, 2011; Wessely et al., 1999). Risk factors that have been found for MUS are female gender, a younger age, and a lower socioeconomic background (Nimnuan et al., 2001). In addition, MUS often leads to frustration in patients and physicians, for no organic explanation for the symptoms can be found or explains the severity of symptoms (Rolfe, 2011). This can result in patients being labelled as 'difficult to handle' or 'frequent flyer' (Houtveen, 2009; Rolfe, 2011). A referral to a psychologist or psychiatrist is often met with scepticism by patients, which has negative indications for further treatment (Page & Wessely, 2003).

In numerous studies, the relationship between MUS and negative affect (NA) has been studied (Deary, et al., 1997; Henningsen, et al., 2003; Janssen, 2002; Watson & Pennebaker, 1989). Negative affectivity is a general predisposition to experiencing aversive mood states (Watson, Clark & Tellegen, 1987; Watson & Pennebaker, 1989). Examples of these states are: anger, disgust, contempt, guilt, fearfulness, nervousness and depression (Watson & Pennebaker, 1989). There is a consensus in the literature that high NA is positively related to more symptom reporting (Bogaerts, Janssens et al., 2010; Van Diest et al., 2005; Watson & Pennebaker, 1989) and a heightened severity of reported symptoms (Bogaerts, Van Eylen et al., 2010; Gaskin, Greene, Robinson & Geisser, 1992; Janssen, 2002).

NA can be seen as an aspect of the personality trait of neuroticism (Watson & Pennebaker; 1989). People who score high on neuroticism have a tendency to react strongly on negative emotions (Larsen & Buss, 2008). Therefore, it is not surprising that neuroticism and NA are positively correlated (De Gucht et al., 2004b). Patients with MUS tend to score high on neuroticism (Rief & Broadbent, 2007). Two psychological disorders characterized by a



heightened experience of negative emotions are anxiety and depression (Sadock & Sadock, 2007). These disorders are commonly associated with MUS. Patients with MUS are significantly more depressed and anxious than healthy controls (Henningesen et al., 2003; Schur et al., 2007). In a population of adults, anxiety and depression were proven to be risk factors for the development of MUS (Janssen, Rosmalen, Ormel, Van Oort & Oldehinkel, 2010). However, the exact relationship between anxiety, depression, and MUS remains ambiguous. Anxiety and depression levels have been found to vary per somatic syndrome (Henningesen et al., 2003). Similarly, in a cross-sectional research for comorbidity patterns of MUS and psychiatric conditions, it was found that individuals with predominantly mental illness were distinct from those with the highest burden of medically unexplained syndromes (Schur et al., 2007). However, although the relationship is not fully understood, anxiety and depression remain important comorbid factors for patients with MUS, possibly through the experience of NA.

Although the relation NA and MUS has been frequently confirmed in research, the application in practise has proven to be difficult (Bakal, Steiert, Coll & Schaefer, 2006). Patients often find it hard to believe that their physical complaints are due to psychological or emotional reactions. An important theory on this matter is that of emotional awareness, or better said, the unawareness of emotion (Lane & Schwartz, 1987 in Lane, 2008). This theory presumes that the conscious experience of emotion is a learned cognitive skill. There are five levels of emotional awareness; level one (bodily sensations) and two (action tendencies) are implicit, whilst level three to five are explicit and require conscious processing (Lane, 2008). If an individual focuses conscious attention to bodily sensations or action tendencies, emotion remains implicit, for the consequences of the emotion and not the emotion itself are consciously processed. Thus, it can be speculated that patients with MUS can experience bodily sensations and a negative mood without being aware of any emotion.

In addition, Bakal et al. (2006) suggest a 'somatic awareness', which is the ability to recognise that thoughts, feelings and bodily sensations can contribute to symptom onset. This statement is supported by a study that investigated MUS and psychological states (Burton, Weller & Sharpe, 2009). It was found that self-reported mood and symptom specific concern were more strongly associated with MUS than nonspecific anxiety of stress. This is remarkable, since anxiety and stress are commonly used as explanations in clinical practise. Burton et al. (2009) suggest that the modest association between symptoms and psychological states is due to the fact that patients with MUS simply do not experience a correlation between their somatic symptoms and their psychological states. So, even though experiencing NA, patients with MUS might not relate this NA to their bodily symptoms.

Thus, patients with MUS seem to be unaware of the emotions that can cause bodily symptoms. Next to that, they are unable to relate their bodily symptoms to their negative mood. This creates two separate states, one of psychological distress, and one of bodily complaints.

The origin of this inability to recognise and interpret emotions can be sought in the attachment style of patients with MUS. An attachment style is formed in early childhood and is of great importance for the development of social-cognitive capacities, such as affect regulation (Fonagy & Target, 2006). Positive associations have been found between the reporting of MUS and abnormal attachment styles (Waller & Scheidt, 2006). Abnormal attachment was much more prevalent in patients who reported unexplained symptoms, compared to those with explained symptoms (Taylor, Mann, White & Goldberg, 2000). In addition, abnormal attachment in a student population was associated with more symptom reporting and the experience of more NA (Bifulco et al., 2006; Wearden, Lambertson, Crook & Walsh, 2005). Therefore, it seems that the consequences of abnormal attachment are of importance in patients with MUS.

Furthermore, Fonagy and Target (2006) state that a secure attachment is of importance for the development of the capacity to mentalize. Mentalization is the perceiving and interpreting of human behaviour in terms of intentional mental states. Examples of intentional mental states are: needs, desires, feelings, beliefs, and goals. Mentalization is important for emotion regulation and relating bodily sensations to underlying mental states, processes that are compromised in patients with MUS, as explained above. Indeed, it has been shown that the presence of abnormal attachment (Waller & Scheidt, 2006) and subsequently difficulties with mentalizing are related to problems with affect regulation (Fonagy & Target, 2006; Taylor, 2010). An important psychological construct on this matter is alexithymia. Alexithymia is considered to reflect a deficit in the cognitive processing and regulation of emotions and literally means 'no words for feelings' (De Gucht et al, 2004b). Abnormal attachment styles have been found to be associated with higher alexithymia values (Gil et al., 2008; Wearden et al., 2005). Subsequently, alexithymia is associated with the reporting of MUS (De Gucht et al., 2004b) and related to increased experience of NA (Bailey & Henry, 2007; De Gucht et al, 2004a, 2004b). Furthermore, it is considered to be a risk factor for developing MUS (Kooiman, 1998; Rief & Broadbent, 2007). Although the relation between alexithymia and MUS seems theoretically sound, the exact relation remains ambiguous. Research now indicates that a specific aspect of alexithymia, difficulty identifying feelings, is important for patients with MUS. This difficulty with identifying feelings is the only aspect of alexithymia that is significantly correlated to NA (Bailey & Henry, 2007) and has a direct effect on MUS (De Gucht et al., 2004b). Therefore, difficulty with identifying feelings could reflect the unawareness of emotions found in patients with MUS.

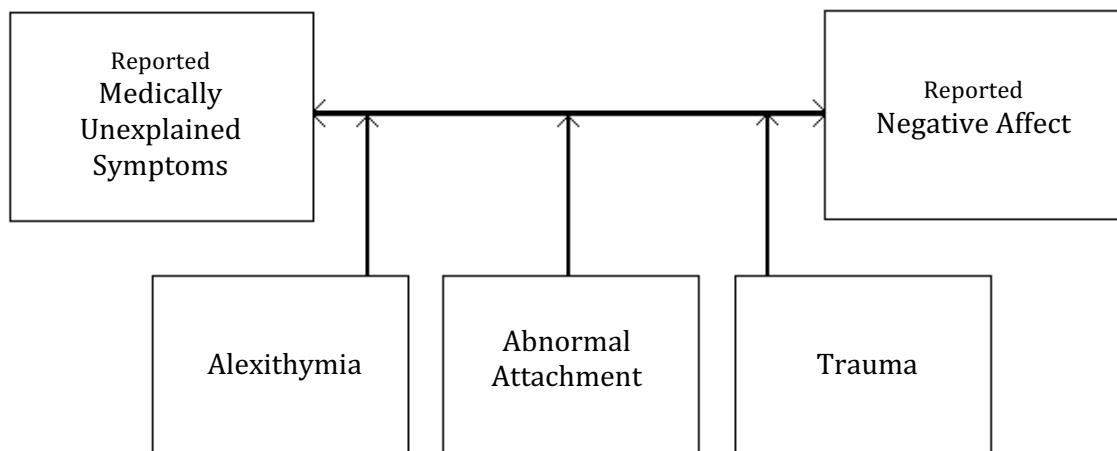


Finally, another significant and much researched experience in patients with MUS is that of a traumatic event (Roelofs & Spinhoven, 2007; Van den Berg et al., 2005). Research indicates that trauma can be a potential risk factor for developing MUS, as people who experienced a traumatic event have significantly more MUS than people who did not (Taylor, 2010; Van den Berg et al., 2005). In accordance, heightened prevalence of trauma has been found in patients with MUS compared to controls (Roelofs & Spinhoven, 2007). The experience of a trauma is associated with the reporting of more NA, such as anxiety and depressive symptoms (Ringburg et al., 2011; Tøien, Bredal, Skogstad, Myhren & Ekeberg, 2011). This relation between trauma and NA has been found to be mediated by attachment style, with an abnormal attachment style predicting more NA (Bifulco et al., 2006). Furthermore, anxiety and depressive symptoms persist and are repeatedly reported even years after the trauma (Ulvik, Kvale, Wentzel-Larsen & Flaatten, 2008). The relation of trauma and MUS seems to be influenced by the nature of the trauma (Roelofs & Spinhoven, 2007). Sexual abuse appears to be related to a higher prevalence and severity of MUS (Sack, Lahmann, Jaeger & Henningsen, 2007), and the experience of a childhood trauma is associated with abnormal attachment styles in adulthood (Waldinger, Schulz, Barsky & Ahern, 2006). Moreover, childhood trauma is associated with the difficulty identifying feelings subscale of alexithymia (Taylor, 2010).

Thus, trauma is more frequently found in patients with MUS compared to healthy controls, and can lead to anxiety and depressive symptoms. Furthermore, specific types of trauma are associated with more severe MUS, abnormal attachment and the difficulty identifying feelings of alexithymia.

The aim of this study is to scrutinize the relation of MUS and NA in a tertiary care patient group by examining the differences between high or low scores on alexithymia, abnormal attachment and trauma. Furthermore, the mediating effects of alexithymia, abnormal attachment and trauma on the relation of MUS and NA will be explored. These effects are schematically presented below (figure 1). Since little is known about the mediating and/or moderating factors in the relationship between NA and MUS, and research on tertiary care patients is scarce, results will provide new insights on MUS in the most severe patient group.

We hypothesise that MUS and NA are positively related, and that high scores on alexithymia, abnormal attachment and trauma will influence this relationship. First, because patients with alexithymia have difficulties identifying their emotions, we hypothesise that alexithymia has a negative effect on the relation between MUS and NA, due to the underreporting of NA. Therefore, a weaker relation is expected for the subgroup scoring high on alexithymia compared to the low scoring group. Second, we expect abnormal attachment to have a negative effect on the relation between MUS and NA, because abnormal attachment is related to increased reporting of MUS, but also to alexithymia, which will lead to the underreporting of NA. Again, we expect the high scoring group to show a weaker relation of MUS and NA compared to the low scoring group. Third, we hypothesise that trauma will strengthen the relation of MUS and NA, because trauma is associated with more NA and more MUS. Therefore, we hypothesize that the high scoring group will show a stronger relation than the low scoring group. Finally, we will examine the mediating effects of alexithymia, abnormal attachment and trauma on the relation of MUS and NA.



**Figure 1.** Proposed model of the moderating and mediating effects of alexithymia, abnormal attachment, and trauma, on the relation between medically unexplained symptoms (MUS) and negative affect (NA).



## Methods

### Patients

Of the 895 people seen for initial consultation at a specialized mental health institution for psychosomatic problems a sample of 338 patients was selected. Due to the use of different questionnaires for the initial consultation, two sets of data were collected. Both datasets included different patients. In total there were 240 women (mean age 42 years, SD= 11) and 98 men (mean age 45 years, SD = 10). The majority of the sample consisted of women (71.0 %). Educational levels were scored according to the Dutch school system. The estimated number of years of education of the levels stated below are: elementary school up to 6<sup>th</sup> grade: 7 years, elementary school: 8 years, uncompleted secondary education: 9+ years, lower secondary education: 10 years, middle secondary education: 12 years, higher secondary education: 13-14 years, bachelor degree: 17 years, and master degree: 18+ years (European Encyclopedia on National Education Systems, 2011). The average level of education for the first group and the total sample was middle secondary education. For the second group higher secondary education was the average level of education. Details are presented in table 1.

**Table 1.** Demographic characteristics per patient group and for the total sample.

Characteristic	Group 1 <i>n</i> = 241		Group 2 <i>n</i> = 97		Total <i>n</i> = 338	
	<i>M</i>	SD	<i>M</i>	SD	<i>M</i>	SD
Age (years)	43	1	43	1	43	1
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Educational level						
Primary education up to 6 <sup>th</sup> grade	3	1.2	1	1.0	4	1.2
Primary education	7	2.9	1	1.0	8	2.4
Uncompleted secondary education	3	1.2	0	0.0	3	0.9
Lower secondary education	59	24.5	17	17.5	76	22.5
Middle secondary education	105	43.6	20	20.6	125	37.0
Higher secondary education	48	19.9	22	22.7	70	20.7
Bachelor degree	0	0.0	27	27.8	27	8.0
Master degree	16	6.6	9	9.3	25	7.4
Sex						
Male	69	28.6	29	29.9	98	29.0
Female	172	71.4	68	70.1	240	71.0



### *Procedure*

Patients were seen for initial consultation at a specialized clinic for diagnostics, advice and treatment of patients with psychosomatic problems. This initial consultation consisted of an introductory presentation about the clinic and the completion of a significant amount of questionnaires. During the completion of the questionnaires people were allowed to ask questions and take a small walk whenever they experienced problems with concentrating or somatic complaints. The results of these questionnaires were used for possible treatment at the clinic. A selection of these questionnaires, as described below, was used for this study. However, during the process of data collection several types of questionnaires were added or dismissed from the consultation. Therefore, two groups of data were created, from which the details are discussed below. Although not all patients received further treatment, all patients seen for the consultation were included in the database.

### *Questionnaires*

**Symptom Checklist Revised (SCL-90-R).** The symptom checklist revised is a 90-item self report symptom inventory used to measure psychological symptoms and distress (Derogatis & Unger, 2010). It consists of nine symptoms dimensions: Somatization (SOM), Obsessive-Compulsive (OBS), Interpersonal Sensitivity (INT), Depression (DEP), Anxiety (ANX), Hostility (HOS), Phobic Anxiety (PHOB), Paranoid Ideation (PAR), and Psychoticism (PSY). Each item represents a symptom or psychological distress and is scored on a five point Likert scale, ranging from (1) 'not at all' to (5) 'extremely' (Buckelew, Burk, Brownlee-Duffeck, Frank & DeGood, 1988). The total score for the dimensions consists of the total score of the items divided by the total number of items in that dimension. The SCL-90-R has been found to have good validity and reliability (Arindell & Ettema, 2005). The reliability of the scales used in this study were all considered good: SOM ( $\alpha = .85$ , 12 items), ANX ( $\alpha = .89$ , 10 items), and DEP ( $\alpha = .81$ , 9 items).

**Checklist Individual Strength (CIS).** The Checklist Individual Strength (CIS) is a 20-item questionnaire intended to measure subjective fatigue and related behavioural aspects (Van Hemert, De Waal & Van Rood, 2004; Vercoulen, Swanink, Fennis, Galama, Van der Meer & Bleijenberg, 1994). There are four dimensions: severity of the fatigue, concentration, motivation and physical activity. Items are scored on a seven point Likert scale, ranging from (1) 'Yes that true' to (7) 'No that not true'. A score of 35 or more on the severity of fatigue dimension is considered an indication of severe fatigue. The reliability and validity of the CIS are considered good (Vercoulen et al., 1994). Furthermore, the CIS is a recommended questionnaire for psychosomatic complaints (Van Hemert et al., 2004).



**Bermond-Vorst Alexithymia Questionnaire (BVAQ).** The Bermond-Vorst Alexithymia Questionnaire (BVAQ) is a 40-item questionnaire measuring five traits of alexithymia (Vorst & Bermond, 2001). These traits are: emotionalizing, fantasizing, identifying, analysing and verbalizing. The scoring is on a five point Likert-scale, varying from (1) 'definitely applies to me' to (5) 'in no way applies to me'. Eight items measure each trait, which results in a score ranging from 8 to 40. The total alexithymia score varies from 40 to 200. Bermond (1995) distinguishes two types of alexithymia. Type I is characterized by the absence of emotional experience, and, as a consequence, by absence of cognitions generally accompanying these emotions. Type II is characterized by the presence of emotions with simultaneous absence of the cognitive components of these emotions. The BVAQ gives the possibility to differentiate these two types of alexithymia. Research indicates that the validity and reliability of the BVAQ are substantial (Vorst & Bermond, 2001). Furthermore, it has been found that the three cognitive subscales: analysing, identifying, and verbalizing, are comparable to those of the Toronto Alexithymia Questionnaire (TAS-20). These subscales can therefore be compared to earlier research with the TAS-20. However, the reliability and validity have only been tested in student populations, so further research will be needed.

**Revised Experiences in Close Relationships (ECR-R).** The Revised Experiences in Close Relationships (ECR-R) is a 36-item self-report questionnaire used to measure adult romantic attachment style (Sibley, Fischer & Liu, 2005). There are two subscales, one measuring attachment anxiety and one attachment avoidance. Items are scored on a seven point Likert scale ranging from (1) 'strongly disagree' to (7) 'strongly agree'. The psychometric qualities of the ECR-R are considered good for reliability and quite good to good for the validity (Fairchild & Finney, 2006; Sibley et al., 2005). The reliability found in this sample is considered questionable for attachment avoidance ( $\alpha = .67$ , 18 items), and acceptable for attachment anxiety ( $\alpha = .79$ , 18 items).

**Traumatic Experiences Checklist (TEC).** The Traumatic Experiences Checklist is a 29 item self-report questionnaire that inquires the presence of a traumatic event (Nijenhuis, Van der Hart & Kruger, 2002). Items are scored (0) 'not present' or (1) 'present'. The total score of the TEC ranges from 0 to 29. Four specific types of trauma: emotional abuse, physical abuse, sexual harassment, and sexual abuse, are further examined on duration, age of onset and the subjective response of the patient. The psychometric qualities of the TEC are considered good. The reliability for this sample for the total score of trauma was considered acceptable ( $\alpha = .71$ , 28 items).

### *Data analysis*

As mentioned above, two sets of data were collected. Group 1 includes data of the CIS, SCL-90 en TEC. Group 2 includes data of the CIS, SCL-90, BVAQ, and ECR-R. The variable MUS was formed by standardizing the SCL-90 somatization subscale and the total score of the CIS. These standardized scores were thereafter combined into a MUS score. NA was composed in the same fashion and consists of the standardized scores of the anxiety and depression subscale of the SCL-90 of which the physical items of the depression subscale were excluded. These physical items included item 5 (loss of sexual interest), 14 (lack of energy), and 19 (loss of appetite) (Arrindell & Ettema, 2005). The scores of the two subscales of abnormal attachment consisted of the average score per subscale (Fraley, 2010; Fraley, Brennan & Waller, 2000). For comparing the somatization, anxiety and depression subscales with other norm groups, raw scores were calculated. The raw depression score did include the physical depression items described above. Data from both groups was used to confirm a relation between NA and MUS. To compare low and high scores on alexithymia, abnormal attachment and trauma the average score of the sample was calculated. All patients who scored below or on average were scored as low-scorers, while all who scored above average were scored as high-scorers. Furthermore, alexithymia scores were used to identify patients who met criteria for type I or type II alexithymia. Analyses regarding abnormal attachment and alexithymia were done using data from group 2. For the analyses on trauma data from group 1 was used.

To test whether MUS and NA were positively related a Spearman's Rho correlation analysis was used, due to the violation of the assumption of normality of NA for the total sample ( $D(338) = 0.07, p = .000$ ), as well as for group 1 ( $D(241) = 0.09, p = .000$ ) and group 2 ( $D(97) = 0.13, p = .000$ ). The same was done to assess correlations between MUS, NA, alexithymia, and attachment scores for group 2, as for MUS, NA, and trauma scores for group 1. The only normally distributed variables were MUS, the alexithymia subscales: fantasizing, identifying and analysing, and anxious attachment for group 2, for which Pearson correlation analyses were used. To examine the differences of low versus high scores of abnormal attachment, alexithymia, and trauma on the relation of MUS and NA the correlation of MUS and NA was again computed per subgroup. In addition, correlation analyses of MUS and NA were also computed for patients who met criteria for type I or type II alexithymia. To determine whether changes in correlation of MUS and NA for the subgroups were significant, linear regression analyses with MUS as outcome variable were performed. All variables met basic assumptions including non-zero variance, no perfect multicollinearity and homoscedasticity. Interaction variables of NA and the subgroups were computed to determine a moderating effect of alexithymia, abnormal attachment, and/or trauma.



Finally, partial correlation analyses were performed. Due to the violation of normality of NA described above, the partial correlations were based on Spearman correlation scores.

#### *Missing data*

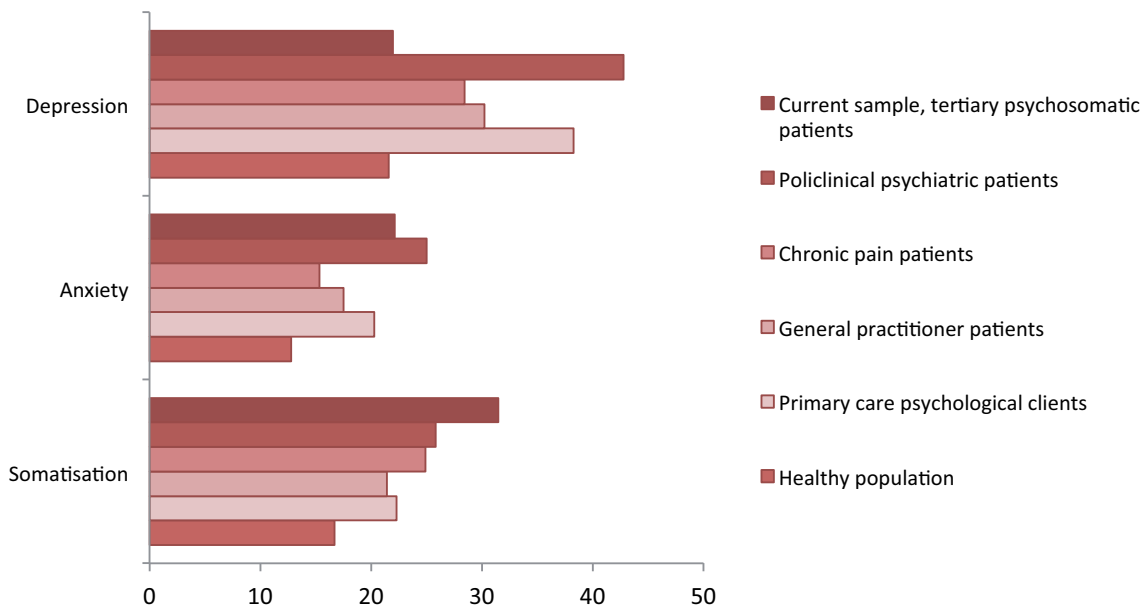
In this study a sample of 338 patients was selected. As described above, these were divided in two groups of data: group 1 ( $n = 241$ ), and group 2 ( $n = 97$ ). Analyses that combined MUS, NA and trauma scores resulted in a much smaller  $n$  for group 1, namely 29 patients, due to missing data or incomplete questionnaires. For similar reasons the  $n$  for correlation analyses of group 2 varied from 83 to 97.

## Results

### *Clinical characteristics*

Of all patients of group two ( $n = 97$ ) 58 patients met the criteria for type I alexithymia and 8 for type II alexithymia.

In order to relate this sample of tertiary care patients to other types of patients or a healthy population, the scores on the SCL-90 subscales: somatisation, anxiety, and depression were compared to the following norm groups: polyclinic psychiatric patients, healthy population, chronic pain patients, primary care psychological clients, and patients of general practitioners (Arrindell & Ettema, 2005). Results are presented in figure 2. Furthermore, in table 2, the scores for anxious and avoidant attachment styles were compared to that of an online norm database (mean age 24 years,  $SD = 10$ )(Fraley, 2010). The online norm consisted mostly of women (78%) a comparable number to this sample. The average scores of the norm group were estimates for a mean age of 40 based on the total sample ( $n = 22000$ ). Additionally, the subscales and total score of alexithymia were compared to previous found mean scores of Dutch students ( $n = 375$ , mean age 21.2,  $SD = 11.2$ , 66% women)(Vorst & Bermond, 2001). Details are presented in table 2. For the VBE, used to measure trauma, no norm groups were found to compare the sample to.



**Figure 2.** Mean scores on the subscales depression, anxiety and somatisation of the SCL-90 for the current sample and per norm group ( $n = 338$ ).



**Table 2.** Mean scores of attachment en alexithymia of group 2 compared to norm groups.

Characteristic	Group 2		Norm group	
	<i>M</i>	SD	<i>M</i>	SD
Internet sample <sup>a</sup>				
Attachment				
Anxious	3.69	0.88	3.45	
Avoidant	3.59	0.68	3.04	
Dutch students <sup>b</sup>				
Alexithymia				
Emotionalizing	29.35	6.08	18.28	5.46
Fantasizing	20.65	6.96	16.19	6.17
Identifying	25.30	7.40	17.72	5.64
Verbalizing	22.82	7.64	13.68	4.68
Analysing	21.56	4.55	20.49	7.65
Total score	119.69	20.65	86.36	17.66

Note. <sup>a</sup>Fraley (2010), <sup>b</sup>Vorst and Bermond (2001).

**Table 3.** Mean scores and correlation analyses of MUS and NA per group and for the total sample.

Variable	Group 1 <i>n</i> = 241		Group 2 <i>n</i> = 97		Total <i>n</i> = 338	
	<i>M</i>	SD	<i>M</i>	SD	<i>M</i>	SD
MUS	-.01	.83	.05	.87	.01	.84
NA	-.02	.93	.01	.91	-.01	.92
Correlation	$r_s = .66^{***}$		$r_s = .69^{***}$		$r_s = .67^{***}$	

Note. \*\*\* $p < .001$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect.

#### *Preliminary analyses*

The relation of MUS and NA has been found to be significant for the whole sample ( $r_s = .67, p = .000$ ), as for group 1 ( $r_s = .66, p = .000$ ) and group 2 ( $r_s = .69, p = .000$ ) respectively. See table 3. Before analysing the effects of the subgroups in attachment, alexithymia, and trauma on the relation of MUS and NA correlation analyses were performed. Details of group 2 are presented in table 4. The subscales emotionalizing ( $r_s = .21, p = .045$ ) and identifying ( $r_s = -.22, p = .036$ ) were significantly related to MUS. In addition, emotionalizing ( $r_s = .27, p = .008$ ), and fantasizing ( $r_s = .30, p = .003$ ) were related to NA. Attachment anxiety appeared to be significantly related to MUS ( $r = .30, p = .004$ ) and NA ( $r_s = .48, p = .000$ ) and attachment avoidance correlated significantly with NA ( $r_s = .22, p = .037$ ). Details of group 2 are presented in table 5. Trauma was significantly correlated with NA ( $r_s = .39, p = .036$ ), but not with MUS.

**Table 4.** Intercorrelation analyses of MUS, NA, emotionalizing, fantasizing, identifying, verbalizing, analysing, and attachment anxiety and avoidance of group 2 (n = 97).

Variable	1	2	3	4	5	6	7	8	9	10
1. MUS	-									
2. NA	.69***	-								
Alexithymia										
3. Emotionalizing	.21*	.27**	-							
4. Fantasizing	.18	.30**	-.02	-						
5. Identifying	-.20	-.40***	.16	-.12	-					
6. Verbalizing	-.16	-.12	.19	.08	.50***	-				
7. Analysing	.02	-.08	.39***	.14	.48***	.47***	-			
8. Total score	-.05	-.05	.50***	.31**	.68***	.76***	.70	-		
Abnormal attachment										
9. Anxiety	.30**	.48***	.02	.17	-.36***	-.29**	-.13	-.25*	-	
10. Avoidance	.05	.22*	.18	.14	-.13	.08	-.11	-.16	-.47***	-

Note. \* $p < .05$ , \*\* $p < .01$  \*\*\* $p < .001$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect.

**Table 5.** Intercorrelation analyses of MUS, NA, and trauma of group 1 (n = 29).

Variable	1	2	3
1. MUS	-		
2. NA	.57 **	-	
3. Trauma	.10	.39 *	-

Note. \* $p < .05$ , \*\* $p < .01$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect.

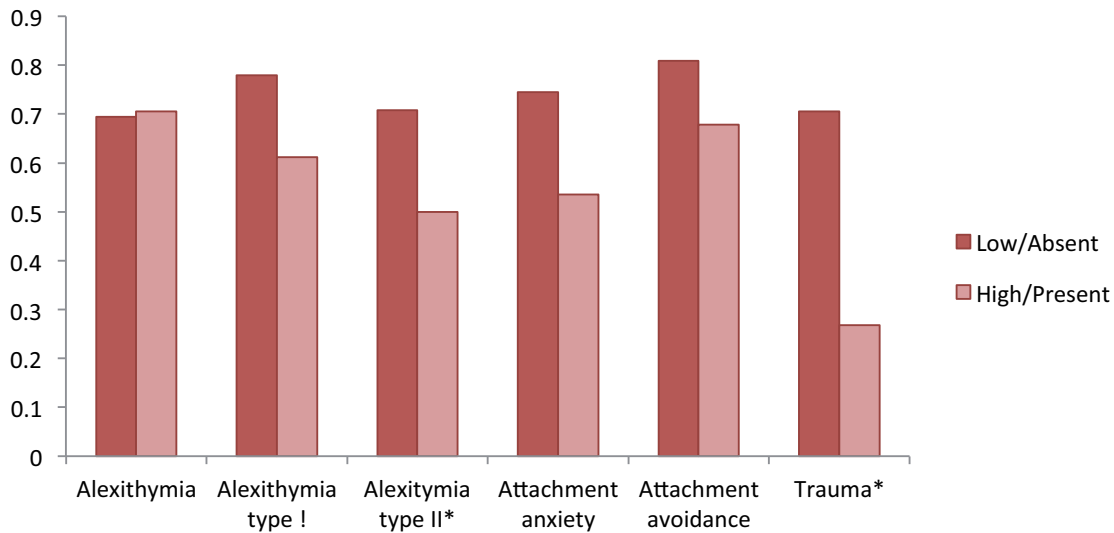
### Moderating effects

To analyse whether the relation between MUS and NA was affected by a high or low score on alexithymia, abnormal attachment, or trauma the sample was divided into high and low-scorers on each variable. The mean scores of alexithymia ( $M = 119.69$ ,  $SD = 20.65$ , range 38 – 164), attachment anxiety ( $M = 3.69$ ,  $SD = 0.88$ , range 1.00 – 5.83), attachment avoidance ( $M = 3.59$ ,  $SD = 0.68$ , range 1.00 – 5.50), and trauma ( $M = 6.34$ ,  $SD = 3.62$ , range 1 – 14) were used to designate each patient to the low or high group. Furthermore, alexithymia scores were used to identify patients who met criteria for type I or type II alexithymia. Correlation analyses of MUS and NA were performed for each variable based on the different subgroups.

For alexithymia, the relation of MUS and NA showed very little difference in low ( $r_s = .70$ ,  $p = .000$ ) or high ( $r_s = .71$ ,  $p = .000$ ) scorers. However, the different types of alexithymia did prove to influence the relationship of MUS and NA. The presence of type II alexithymia altered the relation of MUS and NA ( $r_s = .71$ ,  $p = .000$ ;  $r_s = .50$ ,  $p = .207$ ) more than type I ( $r_s = .78$ ,  $p =$



.000;  $r_s = .61, p = .000$ ). The relation of MUS and NA for low scorers on attachment anxiety ( $r_s = .75, p = .000$ ) proved to be much smaller for high scorers ( $r_s = .54, p = .000$ ). Similarly, low scorers on attachment anxiety showed a stronger relation of MUS and NA ( $r_s = .81, p = .000$ ), than high scorers ( $r_s = .68, p = .000$ ). Finally, low scorers on trauma showed a significant relation of MUS and NA ( $r_s = .71, p = .000$ ), however with high scorers, this relationship was no longer significant ( $r_s = .27, p = .399$ ). Results are presented in figure 3.



**Figure 3.** The relation of MUS and NA divided per subgroup, high en low scorers on alexithymia, attachment anxiety, attachment avoidance, and trauma, and type I and type II alexithymia. A star indicates a non-significant relation of MUS and NA for the high/present category of that subgroup.

To assess whether changes in the relationship of MUS and NA were significant, regression analyses were performed. These regression analyses included NA, the different subgroups, and interaction effects of the subgroups and NA as predictors of MUS. Interaction effects of NA with type II alexithymia, attachment anxiety and attachment avoidance proved to be significant predictors of MUS. For the subgroups of alexithymia and alexithymia type I no significant results were found. Models that showed significant interaction effects are presented in table 6 through 9 below.

**Table 6.** Multiple regression model of NA and type II alexithymia as predictors of MUS.

	<b>B</b>	<b>Std. Error</b>	<b><math>\beta</math></b>
Constant	-0.01	0.07	
NA	0.70	0.08	0.73 ***
Alexithymia type II	-0.45	0.26	-0.14
Interaction NA*Alexithymia type II	-0.61	0.25	-0.21 *

Note:  $R^2 = .50$ . \* $p < .05$ , \*\*\* $p < .000$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect.



**Table 7.** Multiple regression model of NA and attachment anxiety as predictors of MUS.

	<b>B</b>	<b>Std. Error</b>	<b>β</b>	
Constant	0.10	0.10		
NA	0.88	0.13	0.92	***
Attachment anxiety	0.05	0.15	0.03	
Interaction NA*Attachment anxiety	-0.41	0.17	-0.31	*

Note:  $R^2 = .50$ . \* $p < .05$ , \*\*\* $p < .000$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect

**Table 8.** Multiple regression model of NA and attachment avoidance as predictors of MUS.

	<b>B</b>	<b>Std. Error</b>	<b>β</b>	
Constant	0.16	0.09		
NA	1.00	0.12	1.00	***
Attachment avoidance	-0.17	0.13	-0.10	
Interaction NA*Attachment avoidance	-0.42	0.15	-0.33	**

Note:  $R^2 = .57$ . \*\* $p < .01$ , \*\*\* $p < .000$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect.

**Table 9.** Multiple regression model of NA and trauma as predictors of MUS.

	<b>B</b>	<b>Std. Error</b>	<b>β</b>	
Constant	0.23	0.30		
NA	1.30	0.19	1.60	**
Trauma	-0.24	0.13	-0.19	
Interaction NA*Trauma	-0.56	0.24	-0.97	*

Note:  $R^2 = .52$ . \* $p < .05$ , \*\* $p < .01$ . MUS: Medically Unexplained Symptoms, NA: Negative Affect.

### *Mediating effects*

Partial correlation analyses were performed for all significant intercorrelations described above to explore the mediating effects of alexithymia, abnormal attachment or trauma. The relation of MUS and NA in group 2 ( $r_s = .69$ ,  $p = .000$ ) showed little to no change when controlling for emotionalising ( $r_s = .68$ ,  $p = .000$ ), fantasizing ( $r_s = .69$ ,  $p = .000$ ), identifying ( $r_s = .68$ ,  $p = .000$ ), attachment anxiety ( $r_s = .65$ ,  $p = .000$ ), and attachment avoidance ( $r_s = .74$ ,  $p = .000$ ), or when controlled for all three alexithymia subscales ( $r_s = .65$ ,  $p = .000$ ), or both abnormal attachment styles ( $r_s = .69$ ,  $p = .000$ ). Concordantly, controlling for trauma did not lessen the relation of MUS and NA ( $r_s = .57$ ,  $p = .001$ ), on the contrary, it slightly strengthened the relation ( $r_s = .58$ ,  $p = .001$ ).



## Discussion

The present study aimed to investigate the relationship of MUS and NA in the most severe patient group; tertiary care psychosomatic patients. The possible moderating and/or mediating effects of alexithymia, abnormal attachment, and trauma on the relation between MUS and NA were researched.

First of all, in accordance with previous findings, the relation between MUS and NA has been clearly replicated. Both groups as well as the total sample showed strong correlations between MUS and NA.

Second, exploring moderating effects by comparing high and low scorers on alexithymia, abnormal attachment, and trauma provided interesting results. A high score on alexithymia had little influence on the relation of NA and MUS. This result is against our expectations of a negative effect of alexithymia on the relation of MUS and NA. However, the two types of alexithymia as specified by Bermond (1995) did show influence on the relation of MUS and NA. In specific, type II alexithymia, in which the patient does experience emotion but not the common complementary cognitions, had a substantial influence on the relation of MUS and NA. A significant interaction found for type II alexithymia and NA as predictor for MUS confirmed this influence. However, this interaction effect was a negative predictor of MUS, indicating that experiencing type II alexithymia and more NA leads to a decrease in reported MUS. Partly this interaction of type II alexithymia with NA confirms previous findings of De Gucht et al. (2004b) who found the difficulty identifying feelings (DIF) subscale of the TAS-20 the most influential aspect of alexithymia when related to MUS and NA. However, in the present study the comparable subscale of the BVAQ, identifying, showed a negative correlation with NA, in contrast to the positive correlation found for the DIF subscale and NA. Nevertheless, it seems that this particular aspect of alexithymia does play a considerable role in the experience of MUS. Vorst and Bermond (2001, p. 417) define the identifying subscale as: "The degree to which one is able to define one's arousal states". A possible explanation for the negative relation of identifying and NA is the underreporting of NA due to the inability to recognise and define (negative) emotions. Another notable detail is that the loss of experience of emotions is positively correlated with NA. So although patients have greater difficulty experiencing emotions, they do report more NA. It can be speculated that this is possible due to the lack of emotional awareness (Lane, 2008). The patient does not consciously process the emotions, but does experience the implicit bodily sensations and a negative mood. Furthermore, the contrasting correlations of the emotional subscales and the identifying scale could have compromised the results found for the total alexithymia score and the type I alexithymia.

A high score on anxious or avoidant attachment noticeably weakened the relation of MUS and NA. This supports our hypothesis that an abnormal attachment style has a negative effect on

the relation of MUS and NA. An anxious attachment style was associated with more MUS and more NA whilst an avoidant attachment style was solely related to more NA. In addition, intercorrelations of anxious attachment with MUS and NA were greater than that of avoidant attachment. These results correspond to earlier research of Ciechanowshi, Katon, Russo and Dwight-Johnson (2002) who associated adult attachment styles with MUS in patients with hepatitis C. They found that patients with an anxious attachment style reported a greater number of MUS than the other attachment styles (including avoidant attachment). On the other hand, the positive relation of both abnormal attachment styles and NA differ from our hypothesis, since we expected a negative relation between an abnormal attachment style and NA. The greater influence of anxious attachment was replicated in the change in correlation between MUS and NA when controlling for high or low scores of anxious attachment compared to high or low scorers of avoidant attachment. However, the interaction effect of attachment avoidance with NA proved to be stronger than that of attachment anxiety. Both attachment style interaction effects were negative predictors of MUS. A possible explanation for avoidant attachment being a negative predictor is that patients with an avoidant attachment style tend to ignore signals of pain and fatigue, which can lead to inadequate medical treatment (Ciechanowshi et al., 2002). This could explain that, even though patients with avoidant attachment experience more NA, they report less MUS. However, the negative interaction of attachment anxiety and NA remains an ambiguous result and indicates more research.

The effect of a high or low trauma score on the relation of MUS and NA was striking. High scorers on trauma no longer showed a significant relation of MUS and NA. This result is contradictory to our hypothesis. It can be partially explained by the positive correlation of trauma with NA but not with MUS. Also, the total sample for this comparison was quite small ( $n = 29$ ), therefore individual differences could have influenced the relation significantly. Furthermore, the specific type of trauma has not been taken into account, whilst previous research has indicated that the type of trauma is of importance for the effect on MUS (Roel & Spinhoven, 2007). Nevertheless, the change in the relation of MUS and NA remains quite remarkable and indicates an important role for trauma in psychosomatic patients. Further research on trauma and MUS with a larger sample size could clarify this relationship.

Finally, no mediating effects of alexithymia, abnormal attachment, and trauma on the relation of MUS and NA have been found. This indicates that the relation of MUS and NA is unique in the sense that no variance is explained by alexithymia, abnormal attachment or trauma. However, it has been clearly demonstrated that alexithymia, abnormal attachment, and trauma do influence MUS and NA independently.



Because research on this particular patient group is scarce, the sample was compared to other, more frequently researched, norm groups. The comparing of the SCL-90 scores showed that tertiary psychosomatic patients score very high for somatisation. Their average exceeded that of chronic pain patients and polyclinic psychiatric patients, and was almost twice as high as the average found in a healthy population. Also anxiety scores are found to be high, tertiary psychosomatic patients scores are only exceeded by mean anxiety scores of polyclinic psychiatric patients. Again the anxiety scores are almost twice the average found in a healthy population. However, the average score for depression for this sample is quite low. Tertiary psychosomatic patients score just above average of the healthy population and far lower than all other patient groups. This is in contrast with previous findings of heightened depression scores compared to a healthy population or patients with diseases of organic pathology (Henningsen et al., 2003). Furthermore, tertiary psychosomatic patients show heightened scores for anxious and avoidant attachment. Especially the latter one is much higher than found in the norm group, indicating an increased prevalence of an avoidant attachment style in psychosomatic patients. This is concordant with previous findings of Taylor et al. (2000) who found more avoidant attachment styles than anxious attachment styles in primary psychosomatic patients. Finally, alexithymia scores were compared to a Dutch student norm group. All alexithymia scores were heightened compared to the norm group, indicating that alexithymia is severe in tertiary psychosomatic patients.

This study has several strong point as well as limitations. First of all, it has been done on the most severe patient group: tertiary care psychosomatic patients. This provides results of MUS and NA in the most severe patients group. Furthermore, this study sought new insights on the moderating and mediating effects of alexithymia, abnormal attachment, and trauma on the relation of MUS and NA. However, the total number of patients for trauma was quite small. Findings need to be replicated with bigger sample sizes to confirm our results. Furthermore, this sample was divided in two sets of data, which made comparisons of abnormal attachment and alexithymia with trauma impossible.

Conclusively, MUS and NA are significantly related in tertiary psychosomatic patients. Type II alexithymia, abnormal attachment, and trauma have a negative influence on this relationship. Furthermore, these constructs showed moderating effects on the relation of MUS and NA since interactions with NA resulted in negative predictors for MUS. These interaction effects seem to be related to the interaction of type II alexithymia, abnormal attachment, and trauma with NA rather than directly with MUS. This indicates that alexithymia, abnormal attachment, and trauma are all related to problems with affect regulation. Ambiguous reporting of NA in this study can

be due to the unawareness of emotion found in patients with MUS. Moreover, results show that specific aspects of alexithymia and abnormal attachment were related to NA and MUS, which indicates the complexity of these relations and interactions. Possible mediating effects of all constructs were not found.



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