



Low self-compassion in patients with somatoform disorder

*The relationship between self-compassion
and physical symptoms*

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Abstract

Background: Scientific findings and clinical observations suggest that there could be a relationship between somatoform disorder and low self-compassion. The aim of the current study was to examine whether patients with somatoform disorder have lower levels of self-compassion than the general population, and whether self-compassion could be associated with number of symptoms and health related quality of life.

Methods: 236 patients with somatoform disorder, and 236 subjects from the general population filled out several questionnaires regarding self-compassion (SCS), number of symptoms (PSC) and health related quality of life (EQ-5D). Participants of both groups were matched on the basis of gender, age and education level.

Results: Independent samples *t*-test showed a significant difference in self-compassion between the patient group and the general population, $t(458) = -6.99, p < .001$. The effect size (Cohen's *d*) for the observed difference was medium ($d = -0.65$) Multiple regression analysis showed that having a somatoform disorder ($t = -9.37, p < .001$; $t = 10.36, p < .001$) and low self-compassion ($t = -5.31, p < .001$; $t = 4.85, p < .001$) were associated with number of symptoms and health related quality of life. The association of self-compassion with symptoms and quality of life was similar for both groups (no interaction effects were found). The results remained intact after controlling for gender, age and education level.

Conclusion: Patients with somatoform disorder have lower levels of self-compassion than the general population. Moreover, lower self-compassion is associated with more physical symptoms and lower health related quality of life. These findings indicate that self-compassion is a potential clinically important modulating factor and therapeutic target in somatoform disorder.

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Introduction

Background

Scientific findings and clinical observations suggest that there could be a relationship between somatoform disorders and low self-compassion. If this is true, it could provide new opportunities for the treatment of this complex disorder. Therefore, in this study an explanatory model for somatoform disorder will be proposed in which the individual components are theoretically linked to the elements of self-compassion. Then the model will be tested empirically.

Physical complaints that are not fully explained by known medical conditions occur in all medical settings (Fink & Schröder, 2010). When the symptoms become chronic and seriously disrupt normal daily life, patients could be diagnosed with somatoform disorder (Bondo Lind, Delmar & Nielsen, 2014). Somatoform disorder is a broad group of illnesses that have bodily signs and symptoms as a major component. These disorders encompass mind-body interactions in which the brain sends various signals that impinge on the patient's awareness, indicating a serious problem in the body (Sadock & Sadock, 2007). The prevalence of somatoform disorder has been estimated on 4,9% in the general population (Wittchen et al., 2010) and 16% in the consulting population of general practices (De Waal, Arnold, Eekhof & Van Hemert, 2004). Both mental health and medical professionals often describe patients with somatoform disorder as one of the most challenging to treat patient groups (Landa, Bossis, Boylan & Wong, 2012a). Most patients with somatoform disorder experience severe health related quality of life and show a high use of health care (Barsky, Orav & Bates, 2006; De Waal et al., 2004). This high medical consumption causes excessively high costs (Barsky et al., 2006; Konnopka et al., 2012) but in most cases does not lead to an improvement of the symptoms (Landa et al., 2012a). It is therefore necessary to continue searching for new effective treatment methods.

The, in Western psychology, relatively new concept of self-compassion could provide an opportunity in the treatment of patients with somatoform disorder. Self-compassion training programs have been developed, which belong to the third generation of Cognitive Behavioral Therapy (CBT; Hayes, Villatte, Levin & Hildebrandt, 2011; Neff & Germer, 2013). Neff (2003a) defines self-compassion as involving being touched by and open to one's own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one's suffering and to heal oneself with kindness. Self-compassion also involves offering nonjudgmental understanding to one's pain, inadequacies and failures, so that one's

experience is seen as part of the larger human experience. Based on this definition, Neff (2003a) defines self-compassion as consisting of three basic components: (a) self-kindness – extending kindness and understanding to oneself rather than harsh judgement and self-criticism, (b) common humanity – seeing one’s experiences as part of the larger human experience rather than seeing them as separating and isolating, and (c) mindfulness – holding one’s painful thoughts and feelings in balanced awareness rather than over-identifying with them. Though these aspects of self-compassion are conceptually distinct and are experienced differently, they also tend to influence each other. For example: the accepting, detached stance of mindfulness lessens self-criticism and increases self-understanding, and self-kindness and feelings of common humanity can serve to further increase mindfulness (Neff, 2003a; Neff, 2003b).

Explanatory model somatoform disorder

In order to understand why the concept of self-compassion might be relevant in somatoform disorder, it is necessary to gain more insight into the factors that contribute to the development and continuation of somatoform disorder. The following factors are discussed: attention to symptoms, misinterpretation of symptoms, illness worry and rumination, and insecure attachment.

Attention to symptoms. Research suggests that the selective focusing of attention onto physiological processes and bodily sensations plays a role in the development and maintenance of somatoform disorder (Brown, 2004; Deary, Chalder & Sharpe, 2007; Rief & Broadbent, 2007; Rief & Sharpe, 2004). The theory is as follows. Most body parts continuously send sensory signals to the brain. Due to neural filtering processes, most of these signals do not come to consciousness in healthy people. However, selective attention suppresses these filtering processes so that patients with somatoform disorder are constantly aware of the signals their body sends to the brain (Rief & Barsky, 2005). Thereby, selective attention increases bodily signals and amplifies symptoms (Barsky, 1992; Rief & Barsky, 2005). According to Brown (2004) this makes ‘attention to symptoms’ the central element in the explanatory model of somatoform disorder. He argues that “allocating high-level attention to a symptom serves to augment the activation of its representation in the brain and lowers the amount of activation required for it to be selected in future. [...] If symptom focused attention is maintained for a sufficient period, the activation levels of the representations may become high enough to ensure their continued selection over time” (Brown, 2004, p. 804).

Experimental research confirms an attentional bias to threat words in somatoform disorder (Seung-Lark & Kim, 2005; Witthöft, Gerlach & Bailer, 2006).

Misinterpretation of symptoms. Closely related to ‘attention to symptoms’ is the process of interpreting symptoms. Symptoms attributed to benign causes such as lack of sleep, overwork or dietary indiscretion are not likely to cause extreme distress. However, symptoms attributed to a serious disease do cause extreme distress and symptoms will intensify due to such an interpretation (Barsky, 1992). According to Brown (2004) increased attention to symptoms leads to misinterpretations and vice versa thereby influencing and amplifying one another. In somatoform disorder, misinterpretation of symptoms appears to be the strongest predictor of somatic symptoms (Bailer, Witthöft, Bayerl & Rist, 2007) and in most explanatory models, misinterpretation of symptoms is hypothesized as one of the key factors determining the experience of physical complaints (Brown, 2004; Deary et al. 2007; Kolk, Hanewald, Schagen & Gijbers van Wijk, 2003; Rief & Broadbent, 2007; Witthöft & Hiller, 2010).

Illness worry and rumination. Both attention to and misattribution of symptoms trigger illness worry and rumination, which play an important role in the development of symptom chronicity in somatoform disorder (Brown, 2004; Rief, 2007). When someone begins to worry and ruminate about one’s symptoms, these processes are difficult to stop unless symptoms improve (Brown, 2004). Because of the symptoms in somatoform disorders are chronic and medically unexplained they are not likely to improve so that worrying and ruminating continue. Moreover, worry and rumination direct one’s attention inward thereby increasing the perception of bodily signals (Barsky, 1992) and misinterpretation of symptoms (Deary et al., 2007), leading to even more worrying and ruminating (Barsky, 1992; Brown, 2004).

Insecure attachment. In addition to the previously described cognitive processes, various research shows that poor attachment is associated with somatoform disorder (Rief & Broadbent, 2007; Stuart & Noyes, 1999). Attachment is a strong emotional bond that forms between infant and caregiver(s) in the second half of the child’s first year. Many children develop secure attachments in which their caregivers serve as a source of nurturance and affection. For other children, however, attachments seem much less secure and dependable (Leman, Bremner, Parke & Gauvain, 2012). In somatoform disorder, insecure patterns of attachment are much more prevalent than in the general population (Landa, Peterson & Fallon, 2012b; Waller, Scheidt & Hartmann, 2004). The influences of insecure attachment styles are reflected in the patients’ interpersonal behavior: they expect others to be rejecting and hurtful (Landa et al., 2012b), behave in fixed and inflexible ways, are more sensitive to

perceived or real threats and persistently attempt to elicit care from others (Stuart & Noyes, 1999). The wish for close, supportive relationships combined with the fear of interpersonal closeness, mistrust, and expectation that one would be rejected, hurt, deceived, or abandoned by others is the most common relational representation among patients with somatoform disorder (Landa et al. 2012a).

Figure 1 shows a model of the described factors that contribute to the development and continuation of somatoform disorders. It also shows how some factors amplify each other.

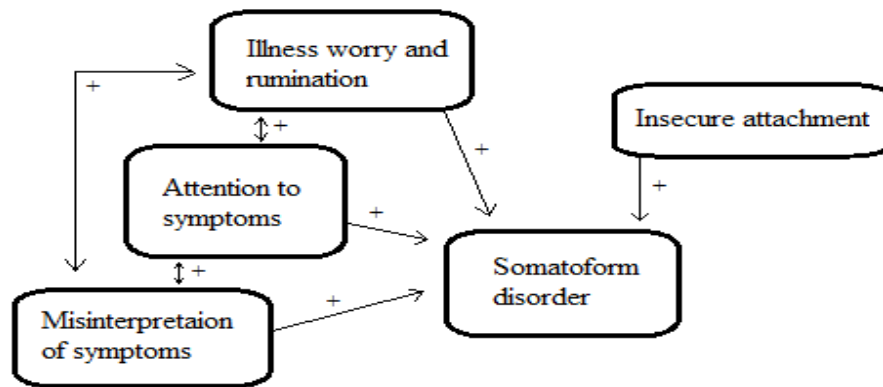


Figure 1. Factors involved in the development and continuation of somatoform disorders.

Link between the model and self-compassion

Each of the factors that is considered to be involved in the development and continuation of somatoform disorder can be linked to the three main components of self-compassion: self-kindness, common humanity, and mindfulness. In the next section, for each of the components will be explained how they can be linked to the factors contributing to the development and continuation of somatoform disorder.

Self-kindness. Research shows that illness worry and rumination contribute to the development of symptom chronicity in somatoform disorder (Brown, 2004; Rief, 2007). Rumination is a repetitive form of thinking about possible causes, meanings and implications of one’s mood, behavior or illness and includes being self-critical (Raes, 2010). Instead of being harshly critical or judgmental toward oneself, the first component of self-compassion – self-kindness – involves the tendency to be mild, understanding and caring with oneself (Neff, 2009). A study by Raes (2010) confirms a negative correlation between scores on the Self-Compassion Scale (SCS) and rumination. This means that the higher the levels of self-compassion, the lower the tendency to ruminate. Therefore, patients with somatoform

disorder are expected to demonstrate low levels of self-kindness, and higher levels of self-kindness are expected to be associated with less symptoms.

Common humanity. Various research suggests that somatoform disorder can be linked to insecure patterns of attachment in early childhood (Landa et al., 2012b; Rief & Broadbent, 2007; Stuart & Noyes, 1999; Waller et al., 2004). Insecure attachment often leads to fear of interpersonal relationships and mistrust towards others which can result in feelings of loneliness and isolation from other people (Landa et al., 2012a). However, the element of common humanity involves feeling connected to others and recognizing that all humans are imperfect, and experience suffering and failure. It also entails seeing one's own shortcomings and difficulties in the greater perspective of the common human condition (Neff, 2003a; Neff, 2009; Neff & Vonk, 2009). In this way, insecure attachment leads to the opposite of common humanity. Therefore, patients with somatoform disorder are expected to show lower levels of common humanity, and higher levels of common humanity are expected to be associated with less symptoms.

Mindfulness. Both 'attention to symptoms' and 'misinterpretation of symptoms' are ways of dealing with symptoms which are often displayed by patients with somatoform disorder (Barsky, 1992; Brown, 2004; Deary et al., 2007; Kolk et al., 2003; Rief & Sharpe, 2004; Rief & Broadbent, 2007; Witthöft & Hiller, 2010). The third component of self-compassion, mindfulness, can be considered its' opposite in that it involves being aware of one's present moment experience in a clear and *balanced* way. It means that one neither ignores nor overemphasizes the troublesome aspects of oneself or one's life (Neff, 2009). Moreover it involves being touched by and open to one's suffering instead of avoiding or disconnecting from it (Neff, 2003a). Given the sustaining role of 'attention to symptoms' and 'misinterpretation of symptoms' in somatoform disorders, it is expected that patients will have low levels of mindfulness. Conversely, higher level of mindfulness could be indicators for less symptoms.

Figure 2 shows a model of the links between the elements of self-compassion and the factors that contribute to the development and continuation of somatoform disorder.

Regarding the expected lower levels on the three main components of self-compassion, the total level of self-compassion as well is expected to be low for patients with somatoform disorder. Therefore, improving (the elements of) self-compassion might lead to a decrease of symptoms (figure 2). Despite a growing body of evidence that self-compassion is strongly associated with less anxiety and depression, more adaptive coping strategies and greater

psychological well-being (see for an overview: Van den Brink & Koster, 2014), no research has been conducted regarding its possible connection with somatoform disorder.

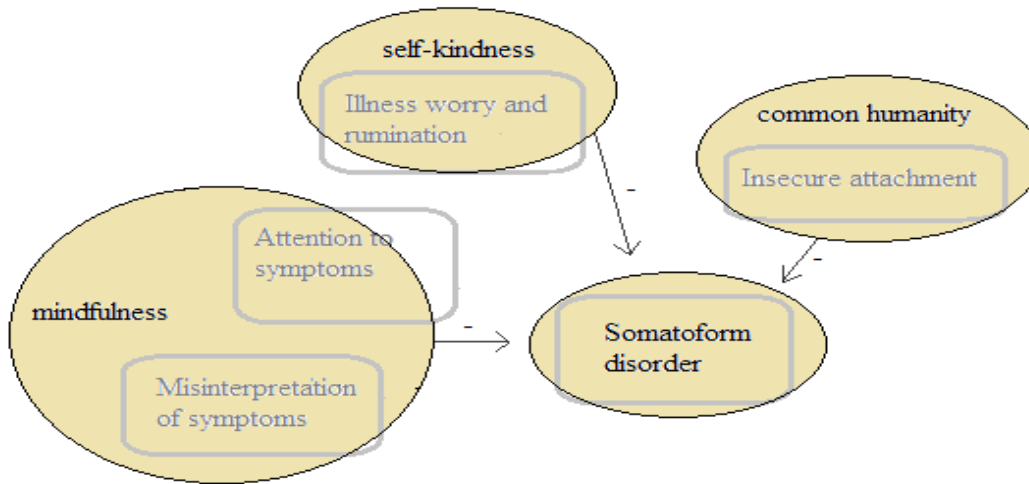


Figure 2. The links between the elements of self-compassion and the factors that contribute to the development and continuation of somatoform disorders, and their possible effects on symptoms.

Hypotheses

The aim of the current study is to get insight into the relevance of self-compassion for somatoform disorder. To that aim, questionnaires regarding physical symptoms and self-compassion will be taken among a patient group diagnosed with severe somatoform disorder (DSM-IV-TR; APA, 2000) and among the general population. First, the levels of self-compassion in the patient group will be compared to the levels of self-compassion in the general population. Second, it will be examined whether there is a correlation between the degree of self-compassion and the nature and number of physical symptoms, both in the patient group and the general population. Based on the proposed model, it is expected that patients with somatoform disorder show lower levels of self-compassion than the general population (H1) and that lower levels of self-compassion are associated with a greater number of physical symptoms (H2a) and lower health related quality of life (H2b).

Methods

Participants

Patient group. The participants from the patient group were recruited at Altrecht Psychosomatic Medicine, Zeist, The Netherlands, a specialized treatment center for patients diagnosed with severe somatoform disorder according to DSM-IV-TR criteria (APA, 2000). Patients with hypochondria, body dysmorphic disorder, addiction, psychosis, and patients in a crisis situation are not treated in the center, and were therefore excluded from the current study. Also excluded were patients who didn't complete the Self-Compassion-Scale (SCS). This resulted in a final sample of 236 participants (64 men and 172 women). The mean age of the sample was 40.8 ($SD = 11.7$).

General population. Participants from the general population were a convenience sample recruited by means of a snowball method of sending emails and posting messages from different Facebook pages in a heterogeneous sample in terms of age, gender and regional area. Exclusion criterion for this group was the presence of medically unexplained symptoms because of its overlap with somatoform disorder. This included fibromyalgia, irritable bowel syndrome, chronic fatigue syndrome and chronic pain. The final sample consisted of 236 participants (64 men and 172 women). The mean age was 40.6 ($SD= 12.4$).

Procedure

Ethical permission. The study protocol was approved by the Faculty Ethics Committee (FETC) of Utrecht University (November 2015, FETC15-072). Informed consent regarding the completion of the questionnaire and its purposes was required for inclusion in this study.

Patient group. Two questionnaires of interest for this study, the Physical Symptom Checklist (PSC) and EuroQoL 5-Dimensional (EQ-5D) were part of the Routine Outcome Measurement (ROM) which takes place during the intake procedure at Altrecht Psychosomatic Medicine. Patients are invited by a psychologist (in training) to fill out questionnaires. This takes place in a separate room in order to provide a quiet environment. If the patient fails to complete the entire ROM in time, the remaining questionnaires can be filled out at home. The SCS was added to the standard assessment procedure for the purpose of scientific research. Several patients didn't complete every questionnaire, didn't complete them on the same day as the SCS or completed several sets of questionnaires during their treatment. In these cases it has been decided to include the questionnaires administered closest

in time to the SCS and to note the number of days between the SCS and the LKV or EQ-5D. Table 1 shows an overview of the available questionnaires per group.

Table 1

Overview of the available questionnaires for the patient group and the general population.

	Patients	General population
SCS	236	236
PSC	225	236
EQ-5D	181	236

Note: SCS = Self-Compassion Scale; PSC = Physical Symptom Checklist; EQ-5D = EuroQol 5-Dimensional

General population. Short recruitment texts with a link to the online questionnaire on www.qualtrics.com (see Appendix 1a) were distributed on the Internet by sending Emails and posting messages on Facebook. By clicking on the link, the information letter and consent form were opened (see Appendix 1b). Signing for informed consent was the only way to open the questionnaire. By choosing the option ‘No, I don’t agree’ or not choosing an option at all, the questionnaire closed immediately. First some demographic information was requested (age, gender, education, marital status, zip code and diseases), thereafter the PSC, EQ-5D and SCS successively could be filled out. All responses were stored online anonymously.

Matching procedure. After excluding participants in the general population with medically unexplained symptoms, random numbers (calculated by SPSS) were allocated to them. In case of multiple possible matches, the lowest random number was chosen. Everyone in the patient group was matched to one participant of the general population on the basis of gender, age and education level. Gender necessarily had to be the same. Age preferably also had to be equal, but if this wasn’t possible, someone closest in age was chosen. Education level was divided into 1) low education level (LO, LBO, LVO, LTS, LEAO), 2) middle education level (MULO, MAVO, VMBO, MBO, MVO, MEAO), 3) high education level (HAVO, HVO, MMS, HBO, HBS, HTS, HEAO, VWO, WO) and 4) unknown. Whenever possible the same level of education was chosen, or otherwise the level that was closest.

Materials

SCS. To measure self-compassion, the Dutch translation of the Self-Compassion Scale (SCS; Neff, 2003b; Neff & Vonk, 2009) was used. This version consists of 24 items measuring the

three main components of self-compassion and their opposites: Self-kindness (e.g. ‘When I am going through a very hard time, I give myself the caring and tenderness I need’) versus Self-Judgement (e.g. ‘I am disapproving and judgmental about my own flaws and inadequacies’), Common Humanity (e.g. ‘I try to see my feelings as part of the human condition’) versus Isolation (e.g. ‘When I fail at something that is important to me, I tend to feel alone in my failure’), and Mindfulness (e.g. ‘When something upsets me I try to keep my emotions in balance’) versus Over-Identification (e.g. ‘When I am feeling down I tend to obsess and fixate on everything that is wrong’) (Neff, 2003b). Items are rated on a seven-point Likert scale, ranging from 1 (almost never) to 7 (almost always). Subscale scores are computed by adding scores of the associated items and a total self-compassion score are computed by reversing the negative subscale items and then adding all subscale scores. Results of a series of studies by Neff (2003b) show that the SCS has a good internal consistency, construct validity, test-retest reliability and discriminant validity. This indicates the SCS as a valid and reliable instrument for measuring self-compassion.

PSC. The Physical Symptom Checklist (PSC; Van Hemert, 2003) is a checklist for measuring the presence of somatic symptoms. The questionnaire consists of 51 items that describe various physical symptoms (e.g. palpitations, insomnia, myalgia, nausea, abdominal pains, headaches). There are 11 general/neurological items, 10 autonomic items, 8 musculoskeletal/pain items, 13 gastrointestinal items, 5 urological/genital items and 4 items about feeling hot/cold (de Waal, Arnold, Spinhoven, Eekhof, Assendelft & van Hemert, 2009). Each symptom is rated on a four point Likert scale (0= I never had problems with it during the previous week, 1= I sometimes had problems with it during the previous week, 2= I regularly had problems with it during the previous week, 3= I often had problems with it during the previous week.). The lowest categories (0 and 1) are scored as 0 and the highest categories (2 and 3) are scored as 1. The total score therefore describes the number of symptoms scored as regularly or often present during the previous week. Research by de Waal et al. (2009) shows that the Cronbach’s alpha of the PSC is 0.88 which suggests a good internal consistency of the checklist.

EQ-5D. The EuroQol 5-Dimensional (EQ-5D) is an instrument to measure health-related quality of life. The questionnaire consists of the EQ-5D descriptive system and the EQ visual analogue scale (EQ VAS). The descriptive system comprises the following 5 dimensions: mobility, self-care, usual activities, pain/discomfort and anxiety/depression. Each dimension has 3 levels: no problems, some problems, extreme problems. The respondent is asked to indicate his/her health state by choosing the most appropriate statement in each of the

5 dimensions. The combination of scores defines a total of 243 health states. Each of these is weighted and contributes to one index score between -0.33 (worst possible health state) and 1.00 (best possible health state). The EQ VAS records the respondent's self-rated health on a visual analogue scale ranging from 0 (=best imaginable health state) to 100 (= worst imaginable health state). The respondent is asked to choose a point on the scale that describes one's current health state. Due to technical problems with the VAS, the respondents in the general population have been asked to choose a number between 0 and 100 that describes one's current health state. Validity research in a population with somatoform disorder shows a good convergent validity of the EQ-5D. It also shows its ability to discriminate between patients with somatoform disorder and the general population (Brettschneider, König, Herzog, Kaufmann, Schaefer & Konnopka, 2013).

Design and data analysis

Design. It concerns a descriptive correlational study with a cross sectional design. The patient group with somatoform disorder will be compared with the general population (independent variable). Outcome measures are the scores on the PSC, EQ-5D and SCS.

Data analyses. Statistical analyses were performed using IBM SPSS statistics version 23.0. All tests were two-tailed and statistical significance was considered for $p < .05$. Descriptive analyses were conducted to examine the differences between the groups. An independent samples *t*-test was used for examining differences in self-compassion between the patient group and the general population. This comparison included both the total scores of the SCS as well as the scores on the subscales of the SCS. Effect sizes (Cohen's *d*) were computed on the basis of the means of the general population. Values of 0.2, 0.5 and 0.8 respectively represent small, medium and large effects. To test the associations between self-compassion and number of symptoms, and self-compassion and health related quality of life, multiple regression analyses were performed. Centered scores were computed for self-compassion (total score SCS) and then entered in Block 1 as predictors for number of symptoms (PSC) or physical impairment (EQ-5D). In Block 2, the self-compassion x group interaction was entered. Finally, in Block 3 gender and age were added as covariates.

Ad hoc analyses. Since the descriptive analyses showed significant differences in education level between the groups, with more highly educated individuals in the general population, all analyses were conducted again for a small group ($n = 248$) that was perfectly matched on education level. In Block 3 of the regression model, education level was added as third covariate.

Results

Description of the samples

Table 2 shows an overview of the characteristics of both groups. In order to check the quality of the matching, some analyzes were conducted. Because gender was chosen to be equal, this match was perfect and no additional analyzes were needed. Age, by contrast, was not perfectly matched. However, independent samples *t*-test didn't show a significant difference between the mean age of both groups ($t(470) = -0.13, p = .90$). Matching based on education level was not perfect either. The education level of only 126 people in the patient group was known. The Chi-square test showed that the education level of the groups differed significantly from each other ($\chi^2(2) = 16.97, p < .001$), with more people with high education in the general population sample.

Table 2

Descriptive variables of the patient group and the general population.

Variable		Patient Group	General Population
Gender	Men	64	64
	Women	172	172
Age	Range	18 – 67	18 – 68
	<i>M</i>	40.77	40.63
	<i>SD</i>	11.74	12.36
Educational Level	Low	9	16
	Medium	60	87
	High	51	139
	Unknown	109	1
Total		236	236

H1: patients with somatoform disorder show lower levels of self-compassion than the general population

An independent samples *t*-test showed significant differences in total scores on the SCS between the patient group and the general population, $t(458) = -6.99, p < .001$. *T*-tests also have been conducted for all subscales separately. The groups differed significantly from each other on every subscale: self-kindness ($t(464) = -7.10, p < .001$), self-judgment ($t(469) = 6.21, p < .001$), common humanity ($t(468) = -6.35, p < .001$), isolation ($t(466) = 3.53, p < .001$), mindfulness ($t(466) = -4.73, p < .001$), over identification ($t(469) = 3.10, p < .01$). Effect sizes (Cohen's *d*) were calculated in order to map the size of the differences found (see table 3). Figure 3 illustrates the differences in self-compassion between the groups, based on individual effect sizes. Patients were found in all categories, but relatively many patients had a low to very low self-compassion in comparison with the general population.

Table 3

Overview of means (M), standard deviations (SD) and effect sizes of the observed differences between the patient group and the general population on the subscales and the total score of the Self-Compassion Scale (SCS).

	patients	general population		
	<i>M (SD)</i>	<i>M (SD)</i>	Cohen's <i>d</i>	Effect
Self-Kindness	3.17 (1.26)	3.97 (1.18)	-0.66	Medium
Self-Judgment	4.81 (1.41)	3.99 (1.44)	0.57	Medium
Common Humanity	3.38 (1.15)	4.06 (1.16)	-0.59	Medium
Isolation	4.15 (1.41)	3.68 (1.46)	0.33	Small
Mindfulness	3.82 (1.26)	4.35 (1.16)	-0.44	Small
Over Identification	4.14 (1.31)	3.75 (1.38)	0.29	Small
Total score SCS	3.53 (0.96)	4.16 (0.98)	-0.65	Medium

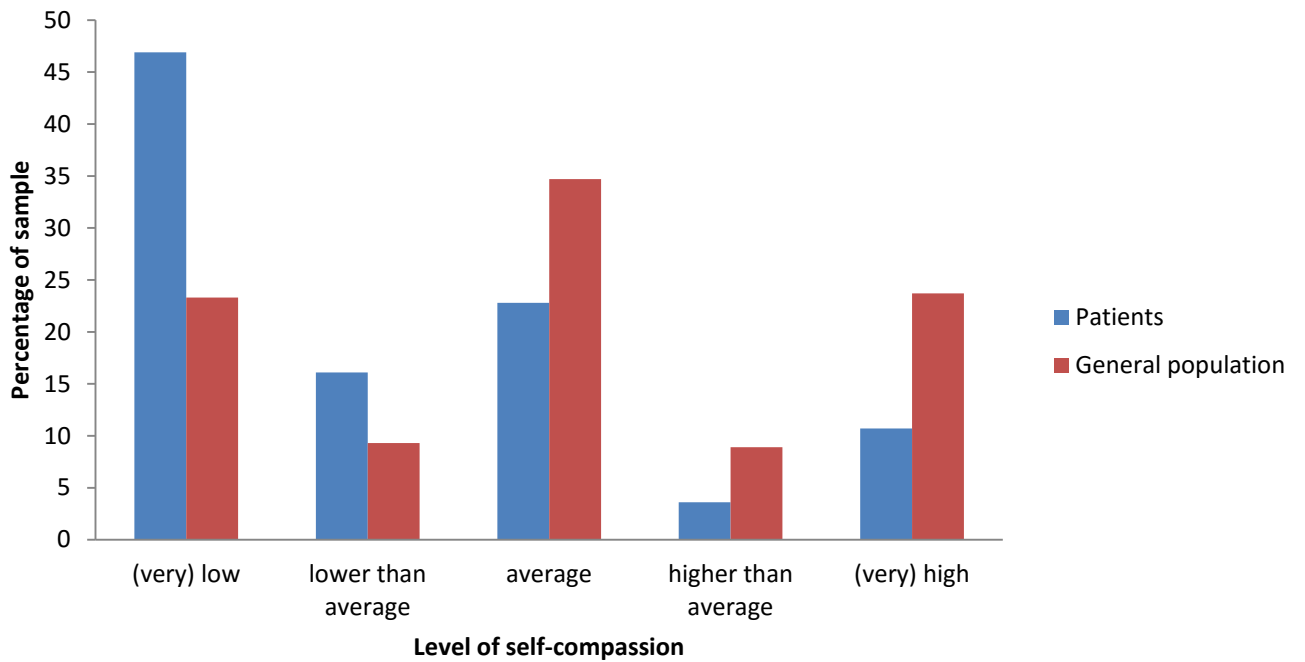


Figure 3. Levels of self-compassion (total score on the SCS) by group, based on individual effect sizes (Cohen's d).

Meaning of the labels: (very) low: $d \leq -0.8$, lower than average: $-0.8 < d \leq -0.2$, average: $-0.2 < d < 0.2$, higher than average: $0.2 < d < 0.8$, (very) high: $d \geq 0.8$.

H2a: lower levels of self-compassion are associated with a greater number of physical symptoms

The mean score on the PSC was 12.32 ($SD = 9.58$). Multiple regression analyses were conducted to predict the number of physical symptoms from levels of self-compassion (see table 4). In Block 1, number of symptoms was shown to be predicted by group ($p < .001$) with somatoform disorder having more symptoms, and self-compassion ($p < .001$) with more symptoms being observed in people with lower self-compassion. In Block 2, the interaction group x self-compassion was added to the model, but no significant interaction was found ($p = .10$), showing that the association between self-compassion and number of symptoms was similar for the two groups. In Block 3, although gender ($p < .001$) and age ($p < .01$) also were associated with number of symptoms, with women and older people having more symptoms, the relation of self-compassion with number of symptoms remained significant ($p = .001$).

H2b: lower levels of self-compassion are associated with lower health related quality of life

The mean score on the EQ-5D was 0.59 ($SD = 0.35$). To predict health related quality of life from levels of self-compassion, another multiple regression analysis has been conducted (see

table 4). In Block 1, health related quality of life was shown to be predicted by group ($p < .001$) with lower health related quality of life in somatoform disorder, and self-compassion ($p < .001$) with lower health related quality of life being observed in people with lower self-compassion. In Block 2, the interaction group x self-compassion was added to the regression model, but no significant interaction was found ($p = .70$), showing that the association between self-compassion and health related quality of life was similar for the two groups. In Block 3, although gender ($p < .01$) and age ($p < .01$) were associated with health related quality of life, with women and older people reporting lower quality of life, the relation of self-compassion with health related quality of life also remained significant ($p < .01$).

Table 4

Regression analyses predicting number of symptoms (PSC) and health related quality of life (EQ-5D) from group (patients: PSC N=225, EQ-5D N=181 versus general population: N=236), self-compassion (total score SCS), group x self-compassion, gender and age.

Variable	Number of symptoms (PSC)			Health related quality of life (EQ-5D)		
	<i>b</i> (s.e.)	β	<i>t</i>	<i>b</i> (s.e.)	β	<i>t</i>
Block 1						
Group	-7.58 (.81)	-.40	-9.37***	0.32 (.03)	.45	10.36***
Self-compassion (SCS)	-2.09 (.40)	-.25	-5.31***	0.07 (.02)	.21	4.85***
Block 2						
Group	-7.58 (.85)	-.40	-8.90***	0.32 (.03)	.46	9.75***
Self-compassion (SCS)	-2.10 (.58)	-.22	-3.63***	0.07 (.02)	.19	2.78**
Group x self-compassion	0.00 (.79)	.00	0.00	0.01 (.03)	.03	0.38
Block 3						
Group	-7.76 (.83)	-.41	-9.40***	0.32 (.03)	.46	9.87***
Self-compassion (SCS)	-1.85 (.56)	-.20	-3.28**	0.06 (.02)	.18	2.69**
Group x self-compassion	-0.04 (.77)	-.00	-0.05	0.01 (.03)	.02	0.36
Gender	4.38 (.85)	.21	5.14***	-0.11 (.03)	-.14	-3.44**
Age	0.09 (.03)	.11	2.82**	-0.00 (.00)	-.12	-2.61**

*Note: ** $p < .01$, *** $p < .001$*

SCS = Self-Compassion Scale; PSC = Physical Symptom Checklist; EQ-5D = EuroQol 5-Dimensional

Ad hoc analyses

In order to examine whether the differences found, could be explained by differences in education level between the groups, analyses were repeated for a smaller sample ($n = 248$) that was also perfectly matched by education level. Age was not perfectly matched, but independent samples t -test didn't show a significant difference in mean age between the patient group and the general population ($t(246) = 0.41, p = .68$).

H1. An independent samples t -test showed significant differences in total scores on the SCS between the patient group and the general population, $t(242) = -3.82, p < .001$. T -tests also have been conducted for the subscales separately. Similar to the analyses in the complete sample, the groups differed significantly from each other on the subscales self-kindness ($t(244) = -3.67, p < .001$), self-judgment ($t(246) = 3.59, p < .001$), common humanity ($t(245) = -3.41, p < .01$), isolation ($t(245) = 2.58, p < .05$) and mindfulness ($t(245) = -2.96, p < .01$). However, group differences on the subscale over-identification were no longer significant ($t(246) = 1.66, p = .10$).

H2a. Multiple regression analyses were conducted to predict number of physical symptoms from levels of self-compassion (see table 5). In Block 1, number of symptoms was shown to be predicted by group ($p < .001$) with somatoform disorder having more symptoms, and self-compassion ($p < .001$) with more symptoms being observed in people with lower self-compassion. In Block 2, the interaction group x self-compassion was added to the model, but no significant interaction was found ($p = .96$), showing that the association between self-compassion and number of symptoms was similar for the two groups. In Block 3, gender, age and education level were added to the regression model, showing that female gender ($p < .001$), low education level ($p < .05$) and high education level ($p < .05$) were associated with greater number of symptoms, while age was not ($p = .11$). However, the association between self-compassion and number of symptoms remained significant after adding the covariates ($p < .05$).

H2b. To predict health related quality of life from levels of self-compassion, another multiple regression analysis has been conducted (see table 5). In Block 1, health related quality of life was shown to be predicted by group ($p < .001$) with more health related quality of life in somatoform disorder, and self-compassion ($p < .001$) with more health related quality of life being observed in people with lower self-compassion. In Block 2, the interaction group x self-compassion was added to the regression model, but again no significant interaction was found ($p = .80$), showing that the association between self-compassion and health related quality of life was similar for the two groups. In Block 3,

gender, age and education level were added to the model, showing that gender was associated with health related quality of life ($p < .01$). However, age ($p = .87$), low education level ($p = .11$) and high education level ($p = .26$) were not associated with health related quality of life. The relation between self-compassion and health related quality of life remained intact ($p < .01$).

Table 5

Regression analyses for a small sample (patients: PSC N=120, EQ-5D N = 100 vs. general population: N=124) perfectly matched on education level, predicting number of symptoms and health related quality of life from group, self-compassion, group x self-compassion, gender, age and education level.

Variable	Number of symptoms (PSC)			Health related quality of life (EQ-5D)		
	<i>b</i> (s.e.)	β	<i>t</i>	<i>b</i> (s.e.)	β	<i>t</i>
Block 1						
Group	-6.11 (1.15)	-.33	-5.33***	0.25 (.04)	.36	5.91***
Self-compassion	-2.03 (.55)	-.23	-3.68***	0.10 (.02)	.29	4.67***
Block 2						
Group	-6.10 (1.20)	-.33	-5.10***	0.25 (.05)	.36	5.48***
Self-compassion	-2.04 (.83)	-.23	-2.49*	0.10 (.03)	.29	2.92**
Group x self-compassion	0.07 (1.11)	.00	0.02	-0.00 (.04)	-.01	0.94
Block 3						
Group	-5.87 (1.10)	-.31	-5.33***	0.24 (.04)	.34	5.37***
Self-compassion	-1.82 (.76)	-.20	-2.40*	0.10 (.03)	.30	3.12**
Group x self-compassion	0.64 (1.03)	.05	0.62	-0.03 (.04)	-.07	-0.72
Gender	5.14 (1.16)	.26	4.44***	-0.15 (.05)	-.20	-3.29**
Age	0.08 (.05)	.09	1.61	0.00 (.00)	-.01	-0.19
Low education level vs medium education level	3.63 (1.87)	.11	1.94	-0.11 (.07)	-.09	-1.47
High education level vs medium education level	-2.55 (1.13)	-.14	-2.26*	0.05 (.04)	.07	1.11

Note: * $p < .05$ ** $p < .01$ *** $p < .001$ SCS = Self-Compassion Scale; PSC = Physical Symptom Checklist; EQ-5D = EuroQol 5-Dimensional

Discussion

This study examined the role of self-compassion in somatoform disorder, and its association with physical symptoms. As expected on the basis of the proposed model, the results show that patients with somatoform disorder have lower levels of self-compassion than the general population. Moreover, lower self-compassion is associated with a higher number of symptoms and lower health related quality of life. These associations remain intact when controlling for gender, age and education level.

Self-compassion and somatoform disorder

This study was the first to establish a relation between self-compassion and somatoform disorder. Previous studies have already shown that self-compassion is associated with depression (Ehret, Joormann & Berking, 2015; Krieger, Altenstein, Baettig, Doerig & Holtforth, 2013; MacBeth & Gumley, 2012), anxiety (MacBeth & Gumley, 2012), post-traumatic stress disorder (PTSD) symptoms (Seligowski, Miron & Orcutt, 2015) and bipolar disorder (Dossing, Nilsson, Svejstrup, Sorensen, Straarup & Hansen, 2015). This study shows that self-compassion also plays a role in somatoform disorder.

The effect sizes of differences in self-compassion between the patient group and the general population in the current study are small (isolation, mindfulness and over-identification) to medium (self-kindness, self-judgment, common humanity and total score SCS), compared to large effect-sizes in bipolar disorder (Dossing et al., 2015). However, the current study used a control group from the general population, while the patients with bipolar disorder were compared to healthy controls. This may be an explanation for the differences in effect sizes. Besides, we observed that a substantial subgroup of patients with somatoform disorder had average, higher than average or (very) high positive levels of self-compassion. This might be less likely in bipolar disorder, taking into account the much smaller standard deviations on the subscales and total SCS score in patients with bipolar disorder compared to patients with somatoform disorder. Despite this apparent wider range in somatoform disorder, it does not reduce the potential clinical significance of low self-compassion in a considerable subgroup of patients with somatoform disorder.

Self-compassion and number of symptoms

The results of this study reveal an association between self-compassion and number of symptoms. However, the absence of an interaction between group and self-compassion shows

that the strength of the association between self-compassion and symptoms is similar in somatoform disorder and the general population. This suggests that self-compassion probably plays a similar role in physical symptoms in people not diagnosed with somatoform disorder. So far, very few research has been conducted in this regard and all of it exclusively focused on the symptom pain. Apparently in contrast to the results of the current study, Purdie and Morley (2015) found that correlations between SCS scores and VAS ratings of pain were not significant. However, only 9 of the 51 items of the PSC are about pain while the rest of the questionnaire concerns other physical symptoms. This suggests that the association between self-compassion and number of symptoms is not only caused by the relationship of self-compassion with pain, but rather by a relationship with a wide range of physical symptoms.

Although no correlations were found between SCS scores and VAS ratings of pain, higher levels of self-compassion were associated with lower self-reported affective responses and less rumination, catastrophizing and avoidance (Purdie & Morley, 2015). Other studies showed that higher self-compassion also was associated with activity engagement, acceptance of pain and less depression, anxiety and stress in patients with chronic pain and rheumatoid arthritis (Costa & Pinto-Gouveia, 2011; 2013), decreased psychopathological symptoms and increased quality of life in chronic and cancer patients (Pinto-Gouveia, Duarte, Matos & Fráguas, 2014), increased positive affect and decreased negative affect, pain disability and pain catastrophizing in obese patients with persistent musculoskeletal pain (Wren, Somers, Wright, Goetz, Leary, Fras et al., 2012) and resilience in adults with spina bifida (Hayter & Dorstyn, 2014).

Altogether, these studies do not seem to indicate a direct relationship between self-compassion and number of symptoms, but rather an indirect relationship with self-compassion affecting the way people deal with pain and physical symptoms, like ruminating (Purdie & Morley, 2015) negative affect (Costa & Pinto-Gouveia, 2013; Purdie & Morley, 2015; Wren et al., 2012) and pain catastrophizing (Wren et al., 2012). This is consistent with the proposed explanatory model of somatoform disorder, which states that attention to symptoms, misinterpretation of symptoms and illness worry and rumination are factors that contribute to the development and continuation of somatoform disorder. It can be concluded that, in accordance with previous research, self-compassion forms a buffer against stressful conditions, and in that way contributes to improved physical and psychological well-being (Hall, Row, Wuensch & Godley, 2013; Neff & McGehee, 2010; Terry & Leary, 2011).

Self-compassion and health related quality of life.

The results show that self-compassion is associated with health related quality of life in somatoform disorder and the general population. However, again no interaction between group and self-compassion was found, indicating that self-compassion also plays a role in health related quality of life in individuals not classified as somatoform disorder. The little research that has been conducted on self-compassion and health related quality of life, took place in the context of pain and medical conditions.

Pinto-Gouveia and colleagues (2014) found self-compassion to be associated with increased quality of life in chronic and cancer patients. However, the questionnaire that was used to measure quality of life in this sample (World Health Organization Quality of LifeBREF – WHOQOL-BREF) also measures psychological health, social relationships and environment. It therefore remains unclear to what extent the physical part has contributed to the correlation between self-compassion and quality of life. Research by Wren and colleagues (2012) could provide more clarity about this. In a sample of obese people with persistent musculoskeletal pain they found a negative correlation between self-compassion and pain disability, which was examined using similar questions as the EQ-5D uses to measure health related quality of life (e.g. questions on domains of self-care and activities). Other studies that examined the role of self-compassion in the context of pain didn't include the specific relationship between self-compassion and health related quality of life, but considering the demonstrated associations of self-compassion with activity engagement (Costa & Pinto-Gouveia, 2011), avoidance (Purdie & Morley, 2015), (pain) catastrophizing (Purdie & Morley, 2015; Wren et al., 2012) and number of symptoms (current study), it is expected to be (directly or indirectly) associated with health related quality of life as well. These findings confirm that self-compassion plays a role in health related quality of life in people not diagnosed with somatoform disorder.

Direction of the relationship.

Another question of interest regarding the association between self-compassion and number of symptoms / health related quality of life, concerns the direction of this relationship. The regression model doesn't show causality, therefore it remains unclear whether lower self-compassion leads to more symptoms and lower health related quality of life or more symptoms and lower health related quality of life lead to lower self-compassion. A third possibility is that they influence each other mutually or that another variable causes both. The

importance of this issue lies in the question whether it is possible to influence symptoms by focusing on self-compassion.

The proposed model suggested that the elements of self-compassion can be considered the opposites of the factors that contribute to the development and continuation of somatoform disorder, and therefore implies a relationship in which self-compassion affects symptoms. This is supported by research indicating that self-compassion training programs lead to improvements in life satisfaction, happiness, resilience and well-being (Neff & Germer, 2013; Smeets, Neff, Alberts & Peters, 2014), reduced depression and anxiety (Neff & Germer, 2013) and diminished physiological responses to threat (Arch, Brown, Dean, Landy, Brown & Laudenslager, 2014). Randomized controlled trials are needed to examine whether improving self-compassion in patients with somatoform disorder could lead to reduction of physical symptoms and improved health related quality of life.

Although no studies are known that included an experimental examination of the reverse relationship between self-compassion and symptoms, it is shown that experiencing secondary medical complications (e.g. chronic pain, pressure sores) in adults with spina bifida, is negatively correlated with self-compassion (Hayter & Dorstyn, 2014). This could indicate that the experience of physical symptoms plays a role in the development of a self-compassionate attitude, but due to the correlational design of the study, again no conclusions about causality can be made. Experimental research in which, for instance, physical sensations are manipulated is needed to examine whether self-compassion might be affected by symptoms.

Limitations

This study has some limitations that need to be acknowledged. First, the matching between patients and general population was not perfect. There were more people with high education level in the sample of the general population compared to the patient group. However, the results of the ad hoc analysis with a sample that was perfectly matched on education level, showed the same results as in the main analysis. Therefore it seems unlikely that the results are affected by this shortcoming.

Second, there was no information available on what point in treatment the patients with somatoform disorder were tested. Self-compassion scores and symptoms may be different at the end of treatment, compared to the beginning or the middle of the treatment program. Possibly, the observed high self-compassion scores in the current study can be attributed to patients who (almost) completed their treatment. This would shed a different

light on the assumption that low self-compassion is only relevant for a subgroup of patients with somatoform disorder. Future research is needed to examine this issue in more detail.

Third, due to the cross-sectional design of this study, no conclusions can be drawn about the direction of the relationship between self-compassion and number of symptoms / health related quality of life. Therefore it remains unclear whether self-compassion influences on number of symptoms and health related quality of life, or whether levels of self-compassion might depend on number of symptoms and health related quality of life.

A final limitation of this study is that several patients didn't complete the full set of questionnaires of interest for this study, or didn't complete the questionnaires on the same day. This causes the sample to include for instance patients' SCS scores from the beginning of the treatment and PSC and EQ-5D scores from a post-treatment measurement. As a result, the associations between self-compassion and number of symptoms / health related quality of life may be slightly different than this study suggests. Still, the current study is an important first step in understanding the role of self-compassion in somatoform disorder.

Future research

Based on the results of this study and the discussed limitations, some suggestions for future research can be made. First, a longitudinal study can be conducted to examine the development of self-compassion during a treatment program. In this way, it is also possible to identify subgroups regarding levels of self-compassion with more certainty. The longitudinal design could be held merely observational, or an experimental factor can be added in which one group receives treatment as usual or a placebo treatment (e.g. education) and the other group also receives self-compassion training. The latter concept provides the ability to examine whether improvements in self-compassion are associated with greater reduction of symptoms and health related quality of life.

Secondly, it can be considered to carry out experimental research to examine the consequences of manipulating self-compassion on functioning (e.g. school or work related performance, social skills, random assignments), to get more insight in the extent of the effects of self-compassion.

A third line of research regarding self-compassion, is to examine its predictive value on the course of the disease (chronicity, prognosis) or treatment outcome. In this, there could be differentiated among mental disorder, somatic disorder and psychosomatic (somatoform) disorder.

Conclusion and implications.

In conclusion, the present study shows that patients with somatoform disorder have lower levels of self-compassion than the general population, and that lower levels of self-compassion are associated with more physical symptoms and lower health related quality of life. These findings give direction to future research regarding self-compassion in populations in which pain and physical symptoms play an important role, and provide new treatment options for a subgroup of patients with somatoform disorder, who have low self-compassion.

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Appendix 1 – Recruitment text and informed consent

Recruitment text.

"Do you want to participate in scientific research? Researchers from the Utrecht University are looking for people who want to participate in a questionnaire study on self-compassion and physical symptoms. Completing the questionnaire takes about 10 minutes. "

Information letter

Dear Madam or Sir,

In this letter we would like to inform you about a questionnaire study of self-compassion and physical symptoms for which we ask your cooperation. Self-Compassion means appreciation for yourself. The research is conducted by student-researcher Charlotte Dewsaran-van der Ven under the responsibility of Prof. Rinie Geenen (Utrecht University). The aim of this study is to portray the levels of self-compassion in the general population. We also want to know if there is a connection between self-compassion and physical symptoms.

We ask you to complete three surveys that measure self-compassion, physical symptoms and quality of life. We will also ask you to fill in some personal information (such as age and marital status, but not your name). Completing the questionnaire will take 10 minutes to 30 minutes depending on the speed at which you work.

All data is collected anonymously. You have no advantage or disadvantage in participating in this study. Your participation in the research is a contribution to our knowledge. You are free to decide whether or not to participate in the research and you can stop at any moment if you no longer wish to participate.

If you wish to participate in this survey, we ask you to sign the informed consent. That is a statutory obligation. You can only start to fill out the questionnaire after you have granted permission by checking the box. For questions, please contact Charlotte Dewsaran-van der Ven: cevvens@hotmail.com

Sincerely,

Charlotte Dewsaran van der Ven and Prof. Rinie Geenen

Informed consent

I have read the briefing on this research. It was possible to ask additional questions via e-mail to the researcher. I had enough time to decide if I wanted to participate. I know that all participation is voluntarily. I know I can decide at any moment to stop participating, I do not have to give a reason for quitting. I give permission to use my answers to the questions, for the purposes listed in the information letter. I give permission to save my data for a maximum of 15 years after this investigation. Please choose one of the options below:

- I agree to participate in this study. I hereby declare that I am 18 years or older and I have taken notice of the reason for this research. I give the researchers permission to use my data.
- I do not want to participate in this study.