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The influence of age on the relationship between the level of self-compassion and physical health

Abstract

Background: Several studies have investigated the relationship of self-compassion and physical health, as well as the association of self-compassion and age. However, little research has been done, examining the dynamics of all three variables.

Aim: The aim of the present study was to explore the association of self-compassion and physical health and whether this relation is moderated by age.

Methods: To investigate the dynamics, a cross-sectional online survey was conducted. The sample was composed of 212 participants, with the majority being from Germany. A wide age range from 18 to 82 and multiple educational levels were covered. Participants were classified into three groups according to their age and completed the Self-Compassion Scale and the Cohen Hoberman Inventory of Symptoms (CHIPS). To investigate differences among young, middle aged and old adults regarding self-compassion and physical health, ANOVAs were conducted. In addition, correlational analyses were used to explore the associations of the variables and a moderation analysis was conducted, to see whether age moderates the relation of self-compassion and physical health.

Results: The results of the present study showed that there was a significant difference ($p<.001$) in self-compassion among the three groups, with young adults having the lowest level of self-compassion with a mean of 3.1 ($SD= 0.7$). Moreover, physical symptoms were associated negatively with age ($r= -0.32$), indicating that older people reported less symptoms. The results display a positive association between self-compassion and age ($r= 0.31$) and a negative association of self-compassion and physical symptoms ($r= -.043$). More specifically, the results reveal that self-compassion may be predictive of physical health in young ($R^2= .08$) and middle-aged adults ($R^2= .22$). Finally, the results of the moderation analysis showed that age did not moderate this relationship ($p= .491$).

Conclusion: From the current study it can be concluded that the constructs self-compassion and physical health are moderately associated and that there are differences in self-compassion among different age groups. It was established that self-compassion increases with age. However, age does not moderate the relation of self-compassion and physical health.

Keywords: self-compassion, physical health, age differences

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Introduction

The relations of self-compassion and mental, as well as physical, health have been a focus of research over recent years. Neff (2003) conceptualized self-compassion and investigated its influence on mental and physical well-being. Her definition of self-compassion is composed of three components: *self-kindness*, the idea of *common humanity* and *mindfulness*. *Self-kindness* entails being kind and compassionate to oneself, especially in times of failure or suffering. Thus, having a non-judgmental attitude towards oneself and one's experiences. The idea of *common humanity* includes the realization that suffering, and inadequacies are part of what it means to be human. This realization entails one's equality to others and that if others are worthy of compassion, the self should be worthy as well (Brown, 1998). The third component is *mindfulness* and it stresses the importance of neither over-identifying with one's negative emotions and thoughts, nor ignoring these. Mindfulness requires a balance between acknowledging feelings and not identifying with them too much, to see that they are part of the human experience. As one is aware of their emotions, one is able to distance oneself enough from them, to see them from a more objective perspective (Neff, 2003). By doing so, it becomes easier to understand the reason behind these emotions and react compassionately towards them.

Several studies have highlighted that self-compassion is closely related to mental well-being. For example, Neff, Kirkpatrick, and Rude (2007) discovered that high levels of self-compassion were positively associated with life-satisfaction, social connectedness and emotional intelligence, while being negatively associated with depression, self-criticism, anxiety. As self-compassion includes the desire to alleviate suffering and to improve one's own well-being, "it means that actions needed for optimal health and functioning are encouraged with gentleness and patience" (Neff, 2003). Optimal well-being does not only revolve around mental health but also physical health (Hassmen, Koivula, & Uutela, 2000). However, research about the relation of self-compassion and physical well-being is much more scarce and only recently emerging.

A recent study by Brown, Bryant, Brown, Bei, and Judd (2016) linked self-compassion to physical well-being. They discovered that higher self-compassion was associated with fewer self-reported physical symptoms. However, it is still not clear how physical health is affected by self-compassion. There may be different routes of how self-compassion influences physical well-being, either directly through improved health behaviours (Sirois, Kitner, & Hirsch, 2015; Terry, Leary, Mehta, & Henderson, 2013) or indirectly through changed biological mechanisms (Gilbert, 2005). It was discovered that self-compassionate people engage in more health-

promoting behaviours and approach their illnesses more proactively (Terry et al., 2013). Apart from improved nutritional habits (Rahimi-Ardabili, Reynolds, Vartanian, McLeod, & Zwar, 2018), it was found that self-compassion is associated with healthy exercising behaviour (Magnus, Kowalski, & McHugh, 2010) and seeking medical care (Terry et al., 2013). A study by Dunne, Sheffield, and Chilcot (2018) revealed that the relation of self-compassion and physical health may be partially mediated by health-promoting behaviours, such as regular sleep and exercise, as well as a healthy diet.

Besides actual changes in behaviour, self-compassion may influence people's health on a biological level. Gilbert (2005) proposed that self-compassion plays a role in hormonal responses in the body. He explained that particularly the oxytocin-opiate system gets activated when individuals engage in self-compassionate behaviour. Increased levels of oxytocin seem to have a stress-protective effect and are associated with low levels of cortisol (Heinrichs, Baumgartner, Kirschbaum, & Ehlert, 2003). A more recent study by Creswell and Lindsay (2014) revealed that mindfulness training even has a buffering effect on the disease process of HIV patients through lower cortisol levels. This is in line with studies that linked mindfulness training to reduced cortisol secretion (Matousek, Dobkin, & Pruessner, 2010) and buffered cortisol-reactivity to stress (Brown, Weinstein, & Creswell, 2012). In a three-month study about self-compassion, participants were asked to write each day about one painful event in which they judged themselves and were then asked to process this situation with a self-compassionate attitude. After one month there was already a significant decrease in physical symptoms (Wong & Mak, 2016). As there is an obvious connection between self-compassion and physical health, it would be interesting to know which factors may influence this relation.

One prominent factor which often is associated with physical health is age. Dewsaran-van der Ven et al. (2018) reported that higher age is associated with more physical symptoms. Among others, Lee, Rexrode, Cook, Manson, and Buring (2001) reported that physical activity may be an significant factor in preventing coronary heart diseases. However, due to different priorities, factors that motivate young adults to exercise differ from factors which motivate older adults (Campbell, MacAuley, McCrum, & Evans, 2001). On that account, it is certainly useful to examine the relation of self-compassion and age, to see if there is any connection to physical health. Several studies explored the association of self-compassion and age. It was discovered by Homan (2016) that self-compassion increased with age. This is in line with a study of K. Neff (2003), she suggested that adolescents and young adults are most likely to have low levels of self-compassion, as they are in a period of their life in which they constantly

evaluate themselves and form their identity. Moreover, in a study about social anxiety disorder, age and self-compassion correlated positively (Werner et al., 2012). Another interesting finding is that self-compassion may promote healthy attitudes towards ageing in mid-life women (Brown et al., 2016). However, little research has been done, investigating the differences in self-compassion among various age groups. Therefore, this study will focus on investigating the physical health and levels of self-compassion in different age groups.

This study

Although these are important discoveries, it is certainly useful to look further into the relationship of physical health and self-compassion and how they are associated with age. Therefore, this study will focus on investigating three research questions. First: 'How are self-compassion and age associated?'. It is expected that self-compassion and age positively correlate. Second: 'How are self-compassion and physical health associated?'. It is expected that people scoring high on self-compassion report less symptoms and thus, are healthier. Finally, the third research question arises: 'Is the relation between self-compassion and physical health moderated by age?'. It is expected that self-compassion and physical health are associated differently for young, middle-aged and old adults (Fig.1). However, as this has not been examined in previous research, no clear expectations have been set. Still, it is assumed that the relationship is stronger for middle-aged and old adults.
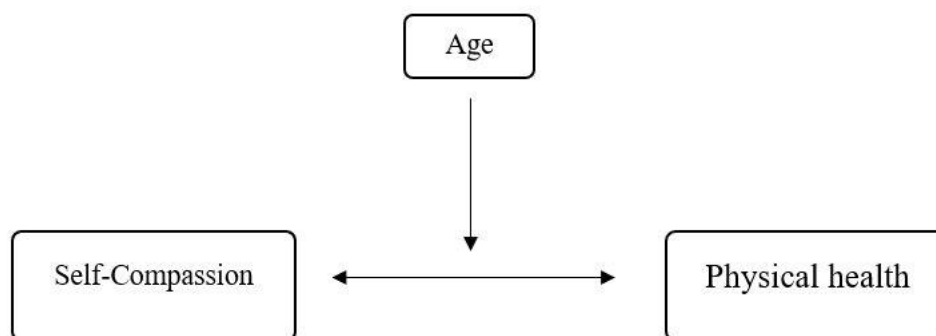

Figure 1. Conceptual model of the relation between self-compassion and physical health moderated by age.

Methods

Design

For this study, a cross- sectional design was employed using correlation and moderation analyses. The present study has been part of a bigger research and therefore, multiple scales about self-compassion, physical, as well as, mental health and health behaviours have been included. Thus, the cross-sectional design was chosen, since it allows to compare many different variables at the same time. However, this study will only focus on self-compassion, physical health and age. The different age groups have been selected because of different lifestyles and priorities that individuals have.

Participants and Procedure

In order take part in the study, potential participants had to be older than eighteen and had to have an adequate understanding of either the German or the English language. The recruitment period was from the 29th of April until the 8th of May 2019. Participants were mostly recruited via email using the snowball sampling method. Thus, researchers recruited people within their personal network, who in turn recruited new participants among their acquaintances. Additionally, some participants were recruited through the recruitment platform SONA. The SONA system is a platform where students can upload their own research projects and participate in studies of others. Although participation is voluntary, SONA points are being used as incentives, since it is mandatory for students of Psychology and Communication Science, at the University of Twente, to obtain 15 SONA credits during their Bachelor's program.

Overall, a convenience sample of 305 participants was drawn, of which 294 participants have been recruited in personal networks and eleven in SONA. However, 93 of them had to be excluded, as they did not finish the study. Thus, the final sample consisted of 212 participants. The mean age was 38 years and the majority of participants were females from Germany. Moreover, participants were mostly students or obtained a Bachelor's degree and are full-time employees. Chronic diseases and physical handicaps only occurred rarely. Prior to the data collection, the study was approved by the Ethics Committee of the Faculty of Behavioural Management and Social Sciences of the University of Twente. Participants, who had been recruited via email, got sent a link which would direct them to the Qualtrics page of the study. In Qualtrics, a qualitative research software, the participants were informed about the aim of

the study, the handling of the data and their right to withdraw from the study at any point. Furthermore, the participants were informed that by proceeding with study, they would give their consent and agree to the mentioned terms. Subsequent, if they gave their informed consent, they were asked to follow the instructions on Qualtrics and to fill out the questionnaire. In case of uncertainty or questions, the participants had the opportunity to contact the researchers at any point during the study.

Table 1.

Demographics of the Sample (*N*=212)

Variable		Frequency	%
Age			
	18-35	107	50.5
	36-59	91	42.9
	60-82	14	6.6
Gender			
	Male	65	30.7
	Female	147	69.3
Nationality			
	German	198	93.4
	Dutch	3	1.4
	Other	11	5.2
Educational Level			
	Less than a high school diploma	33	15.6
	High school graduate	102	48.1
	MBO	4	2.0
	Bachelor's degree	24	11.3
	Master's degree	39	18
	Doctorate degree	10	5.0
Occupation			
	Full-time employee	70	33
	Part-time employee	20	9.4
	Self-employed	26	12.3
	Unemployed	1	0.5
	Student	66	31.1
	Trainee	8	4.7
	Pupil	3	1.0
	Retired	9	4.0
	Other	9	4.0
Chronic diseases			
	Yes	29	13.7
	No	183	86.3
Physical handicap			
	Yes	17	8.0
	No	195	92.0

Materials

All questionnaires that are included in this research, have been established and validated prior to this study and have been selected based on relevant literature. The items of those questionnaires together with demographic questions have been inserted in Qualtrics. The questionnaire started with questions about gender, age, nationality, educational level and occupation. Furthermore, participants were asked if they have any chronic diseases or disabilities. Following, the participants were given the Self-Compassion Scale Short Form by K. D. Neff (2003) to investigate their level of self-compassion. Moreover, the Cohen-Hoberman Inventory of Physical symptoms (CHIPS, 1983) was used to examine the participants' physical health and their perceived stress due to physical symptoms.

Self-Compassion

In order to measure the participants' level of self-compassion, the Self-Compassion Scale- Short Form (SCS- SF) was used. The original scale was used for English speaking participants and for German ones the officially translated version SCS-D (Hupfeld & Ruffieux, 2011) was used. The Self-Compassion Scale intends to measure how people act towards themselves, especially in difficult times, for example when being confronted with personal difficulties or failure. Consisting of 12 items, the scale comprises six subscales, namely *Self-Kindness, Self-Judgment, Common Humanity, Isolation, Mindfulness and Over-Identification.* Consequently, each subscale includes two items.

All items can be answered on a Likert-Scale from 1 (Almost never) to 5 (Almost always). For instance, participants had to answer the statement: "I'm disapproving and judgmental about my own flaws and inadequacies." (item 11, Self-Judgement). An example for the subscale *Self-Kindness* would be: "I try to be understanding and patient towards those aspects of my personality I don't like." (item 2). Item five: "I try to see my failings as part of the human condition." is part of the subscale *Common Humanity*. The statement: "When I fail at something that's important to me, I tend to feel alone in my failure." is an exemplary item (no.8) of the subscale *Isolation*. Finally, "When something painful happens I try to take a balanced view of the situation."(item 3) is an example for the subscale *Mindfulness* and "When I'm feeling down I tend to obsess and fixate on everything that's wrong." is an example for the subscale *Over-Identification.* In order to generate an overall self-compassion score, items of the negative subscales, namely *Self-Judgment*, *Isolation* and *Over-Identification*, had to be reversed (i.e.,1=5, 2=4, 3=3, 4=2, 5=1). Accordingly, the total mean, ranging from 1 to 5, was computed. Higher scores are indicative for a greater level of self-compassion.

For the present study, good overall internal consistency was demonstrated with α=.83. However, the Cronbach's Alpha values of the subscales are only reasonable or even inadequate: *Self-Kindness* α= .45, *Common Humanity* α= .42, Mindfulness α= .55, *Isolation* α= .69, *Self-Judgment* α= .77 and *Over-Identification* α= .58.

Physical Health

In order to assess the participants physical health, the Cohen-Hoberman Inventory of Physical Symptoms (CHIPS, 1983) was used. This scale measures perceived stress because of physical symptoms. To provide German participants with the questionnaire, each item has been translated by the researchers. The questionnaire includes 33 physical symptoms, ranging from skin problems, over digestion-related issues to headaches. All items can be answered on a Likert-Scale from 0 (not been bothered at all) to 4 (extremely bothered). In order to generate the total score, the responses of all 33 items have to summed up (possible score range 0-132). Higher total scores are indicative for greater level of distress because of physical symptoms. Reportedly the CHIPS has good discriminant, as well as, construct validity (Allen, Wetherell, & Smith, 2017). The Cronbach's Alpha for the present study was .88.

Data analysis

In order to analyse the obtained data, the statistical software SPSS version 24 (IBM Corp.,2017) was used. The data of all answers have been exported from Qualtrics to SPSS. To begin with, an overview of the demographics has been obtained by establishing descriptive frequencies with SPSS. A One-Way ANOVA was chosen to see if there were any significant differences in self-compassion and physical health across the three age groups. In addition, a Tukey Post-Hoc Test was applied to see the specific differences between the three groups. The mean difference is significant at the 0.05 level. Following, preliminary analyses were conducted to explore the relationships among the variables. Thus, Pearson's correlation analyses were used to investigate the association between self-compassion, physical health and age. Moreover, a linear regression analysis was used, to further investigate the association of self-compassion and physical health. Self-compassion was set as the independent variable and physical health was set as the dependent variable. Finally, in order to investigate whether the relation of self-compassion and physical health is moderated by age, a multiple regression analysis using PROCESS was chosen. Again, self-compassion was the independent variable, physical health the dependent one and age was set as the interaction term.

Results

Descriptive statistics

In the following, the results of this study are described. Table 2. Shows the mean scores and standard deviations of physical symptoms and self-compassion for each age group. The average CHIPS score of the whole sample was 18.8 (SD= 13.6) and the mean of the self-compassion scores was 3.3 (SD= 0.7). Results of the One-Way ANOVA showed a significant difference in physical symptoms between the three groups (F(2,209)= 10.72, p<.001).Taking a closer look, young adults reported significantly more physical symptoms than middle age (p<.001) and old adults (p=.024). However, middle aged and old adults did not differ significantly in regard to physical symptoms. Concerning self-compassion, young adults showed the lowest scores of the sample. A Post-Hoc test demonstrated that young and middle-aged adults differed significantly (p<.001) with regard to self-compassion.

Table 2.

Means and standard deviations on Self-compassion (SCS) and the Cohen-Hoberman Inventory of physical symptoms (CHIPS) by age (N= 212)

	Young (18-35 years) (*n*= 107)		Middle (36-59 years) (*n*=91)		Old (60-82 years) (*n*= 14)		Total (18-82 years) (*N*= 212)		
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*p-value*
CHIPS, range 0-132	22.9	13.2	14.8	12.8	13.0	13.3	18.8	13.6	<.001*
SCS Total, range 1-5	3.1	0.7	3.5	0.7	3.5	0.7	3.3	0.7	<.001*

*Obtained through One-Way ANOVA investigating difference between groups, significant at <.001

Self-compassion and age

Regarding the first research question, the results show a statistically significant association between self-compassion and age in general (r= 0.307, N=212, p<.001). This reveals that older people seem to be more self-compassionate than young and middle aged adults.

Self-compassion and physical health

The results regarding the second research question revealed that self-compassion and physical symptoms are negatively associated $(r = -0.427, p<.001)$, indicating that lower levels of self-compassion are associated with more physical complaints. However, it appears that the correlation is stronger for middle-aged adults $(R^2 = .23)$, compared to the younger $(R^2 = .08)$ and older $(R^2 = .07)$ group (Fig. 2). Further investigations displayed an overall significant regression equation $(F (1, 210) = 46.7, p< .001)$, with an R^2 of .182, indicating that 18% of the variance in the CHIPS scores may be predicted by self-compassion. However, when conducting the regression analysis for each age group separately, the results are only significant for the young group $(F(1, 105) = 9, p=.003)$ and for the group of middle-aged adults $(F(1, 89) = 26.5, p<.001)$, but not for the old group $(F(1, 12) = .9, p=.368)$. Thus, eight percent of the variance in physical symptoms of the young group and 22% of the variance in physical symptoms of the middle group may be predicted by self-compassion.
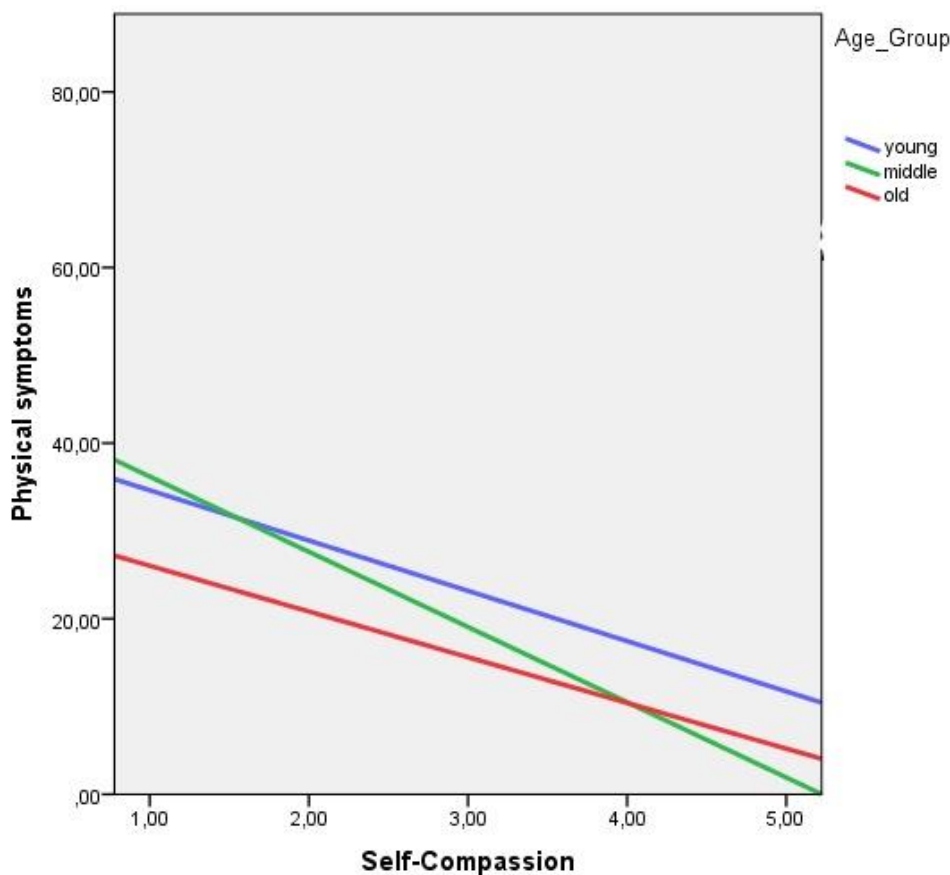

Figure 2: *Scatter Plot*: Correlation between self-compassion and physical symptoms

An interesting finding was that age (in years) correlated negatively with physical symptoms $(r= -.032, p< .001)$, indicating that older people reported less symptoms.

Moderation

Finally, it was investigated whether the relationship of self-compassion and physical health is moderated by age. The regression analysis revealed the following overall model equation: $F(3, 208)=19.7$, $p<.001$, $R^2=.22$. Therefore, 22% of the variance in the CHIPS scores is due to self-compassion, age and their interaction. However, looking at the predictors separately (Table 3.), no significant influence on physical health was found; self-compassion (b=-4.96, $t(208)$=-1.56, p=.119) and age (b=.00, $t(208)$=.01, p=.989). Furthermore, no significant interaction effect of self-compassion x age was observed, since the p-value was larger than 0.05 (p= .491). Thus, the relationship between self-compassion and physical health is not moderated by age.

Table 3.

Linear Model of predictors for physical health (N= 209)

Predictors	b	SE	t	$p*$
Self-compassion	-4.960	3.173	-1.563	.119
Age	.003	.252	.013	.989
Interaction (self-compassion x age)	-.052	.075	-.690	.491

Note: df=(1, 208), age in years was used, not in the respective groups, overall model: $F(3, 208)=19.7$, $p<.001$, $R^2=.22$

*significant at $p<.001$

Discussion

Self-compassion and age

The aim of the present study was to further investigate the relationship of self-compassion and physical health and whether age moderates this relationship. Regarding the first research question it was found that self-compassion increased with age, indicating that older people have higher levels of self-compassion. This is in line with the idea, that individuals progress over the course of their lives and ideally learn through their experiences and possibly cultivate self-compassion (Werner et al., 2012). The associations of self-compassion and age in the present study was moderately strong and even higher than in a study conducted by Neff and Vonk (2009). As K. Neff (2003) suggested, adolescents and young adults still form their identity and constantly evaluate themselves, and therefore may report lower levels of self-compassion. The results of the present study confirm these findings, as the youngest group had the lowest mean of self-compassion. A possible explanation for this may be that people from the age of 18 till 30 are still developing their sense of self (K. Neff, 2003) and are experiencing pressure for good evaluations in academic and job performance (Harter, 1993). The findings of the current study suggest that institutions that work with young adults, for example schools and universities, could offer programs to help their students elevate their level of self-compassion. By doing so, they may support them in dealing with academic pressure that students experience.

Self-compassion and physical health

Concerning the second research question, the results show that lower physical symptoms are associated with higher levels of self-compassion. The association in the current study was moderately strong, similar to a study by Homan and Sirois (2017) who found that self-compassion significantly correlated with physical health. These results are in line with a pervious study discovering that individuals who regularly engaged in self-compassion exercises over a period of three months reported less physical symptoms than the control group (Wong & Mak, 2016). Knowing that higher levels of self-compassion are associated with lower levels of physical symptoms, medical practice could accompany regular treatment with self-compassion exercises to improve the recovery of patients. In addition, general practitioners could inform their patients about the benefits of self-compassion, to show them that it may be a possible alternative to medication.

Furthermore, the results show that the level of self-compassion of people might be predictive of their physical health. This is in line with Dunne et al. (2018), who found that self-compassion predicts better physical health. However, in the current study, the results were only significant for young and the middle-aged group. It is notable that in the middle-aged group 22% of the variance in physical symptoms could be explained by the participants' level of self-compassion. A study conducted by Hall, Row, Wuensch, and Godley (2013), discovered that self-compassion partly predicts physical health. However, they found that only the dimensions *Self-Kindness* and *Self-Judgment*, as well as, *Isolation* and *Common Humanity* are predictive of physical symptoms. The dimension *Mindfulness* and *Over-Identification*, on the other hand could not predict physical symptoms. In 2011 a study found self-compassion to be negatively associated with self-reported physical health (Raque-Bogdan, Ericson, Jackson, Martin, & Bryan), which is contradictory to the present study and recent research. A possible explanation of this contradiction may be that the study used a questionnaire (Medical Outcomes Short Form Health Survey), which predominantly assesses physical functioning, whereas the Cohen Hoberman Inventory of Symptoms, used in the present study, assesses perceived stress due to physical symptoms. Nevertheless, the findings of the present study still give insights which can be used for current practice. As mentioned above, health interventions might focus on raising participants' levels of self-compassion, in order to improve their physical well-being.

The relation of self-compassion, physical health and age

The third main goal was to investigate whether the relationship of self-compassion and physical health is moderated by age. Although there seems to be a link between self-compassion, physical health and age, the results show that the interaction of self-compassion and age does not influence physical health. Therefore, it can be inferred that the relation of self-compassion and physical health is not moderated by age. However, it should be noted that in the moderation model even self-compassion on its own, was not a significant predictor. This is contradictory to the regression analysis that was conducted, to investigate the second research question. A possible explanation for these contradictory findings might be that the significance level changes because a different analytical method has been used. Looking into current research, it has been found that self-compassion relates to physically health through different mediatiors (Dunne et al., 2018; Homan & Sirois, 2017). The results of the study by Dunne et al. (2018) suggest that self-compassion partially mediates physical health thorugh health-promoting behaviours like healthy eating and exercising habits, as well as regular sleep. Homan and Sirois (2017) on the other hand found that self-compassion has a positive effect on health

through the reduction of perceived stress. They discovered that self-compassion relates to physical health through a combined pathway of perceived stress and health behaviours. From the present study it can be concluded that the relationship of self-compassion and health is not dependent of age. This relationship is complex and may be influenced by mutiple factors. Therefore, future research is needed to investigate the dynamics of self-compassion and physical health in a more detailed way. Possible factors future research could target, may be participants' gender, educational status or mental health.

One unexpected finding was the negative association of physical symptoms and age, meaning that younger individuals reported greater level of distress because of physical symptoms than their older counterparts. This was surprising, as higher age is generally associated with more physical symptoms (Dewsaran-van der Ven et al., 2018). A possible explanation for this difference could be that the CHIPS measures symptoms like tense muscles and headache, young people may score higher on them due to stress in their everyday life. Reason for this might be that younger adults experience more pressure for good evaluation in academic and job performance (Harter, 1993). In addition, young adults scored relatively high on the dimension of *Self-Judgement*. Hall, Row, Wuensch, & Godley, 2013 suggested that individuals who judge themselves more, engage less in health promoting behaviours. This may be another possible explanation for why they report more physical symptoms.

Strengths and Limitations

Some charactersistics of the present study can be considered as strong points, as they stand out. For one, the sample of this study was relatively large with 212 participants. Most results can be considered as representative, since the sample size is large, covers multiple educational levels and stretches over various jobs and lifestyles. Especially the wide age range can be considered as a standout characteristic. Because participants from the age of 18 to the age of 82 have been recruited, multiple comparisons between the three age groups were possible. Thus, this study adds value to curent research, as comparisons to this extent have not been done before. Finally, all instruments that have been used in this study had a high reliability (.83 & .88). Thus, the results can be interpreted as meaningful.

Although the present study generally gives more insights into the relationship of self-compassion and physical health, there are some limitations that need to be considered. Firstly, 93 of the participants did not complete the questionnaire and therefore had to be excluded from the study. This high dropout rate may be due to the high workload which was caused by the

fact that this study was part of a bigger research and participants had to fill out many questionnaires. A possible explanation for this might be that participants may have been bothered by the workload, so they did not continue. While developing the study, the researchers were conscious about the workload and therefore used short versions of some scales to reduce the time participants had to spend. This was also the case for the Self-Compassion Scale by Neff, which 14 items shorter than the long version. However, this can be regarded as the third limitation, since every subscale only includes two items and thus, the respective reliability coefficients are only moderate or inadequate ($\alpha < .7$). Nevertheless, the choice concerning the time-reliability trade-off was made and the subscales were therefore, not included in any analyses. Therefore, future research should possibly use fewer questionnaires, to be able to use scales with high reliability and without losing participants due to excessive length of the study and thus, higher workload.

Secondly, for investigating physical health it would be useful to use a health measurement like the Body Mass Index (BMI) additionally to the questionnaire, in order to measure participants' health status more accurately, as the CHIPS only measures self-reported symptoms of the past two weeks. Self-reported measures can be prone to a reporting bias and self-compassionate people potentially underestimate and therefore under-report the severity or frequency of their physical symptoms (Dunne et al., 2018). Using a measurement like the BMI could add a more objective component to measuring health.

Finally, it is suggested that a longitudinal study design would be reasonable to see whether individuals' self-compassion changes, as they progress over time and possibly cultivate more self-compassion through life experiences (Werner et al., 2012). It would certainly be interesting to accompany individuals over years and see whether their self-compassion increases and if so, what factors are involved. However, it is questionable whether such a study design is feasible.

Conclusion

Overall, the present study gave further insights into the relationship of self-compassion and physical health. It was established that there is a link between an individual's level of self-compassion and their physical health. More specifically, it was found that lower physical symptoms are associated with higher self-compassion and that self-compassion may possibly be predictive of the physical health of an individual. The role of age is still not fully discovered yet, but it is clear that self-compassion increases with age. From this study it can be concluded that age does not moderate the relationship of self-compassion and physical health.

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Appendices

A: German questionnaire

Einladungsbrief

Herzlich Willkommen!

Sie wurden eingeladen an der Forschungsarbeit über Selbstmitgefühl und Gesundheitsverhalten teilzunehmen. Diese Studie wird von Marlene Dahm, Sophia Bauhuf, Hannah Honsel und Maja Kalkofen von der psychologischen Fakultät an der Universität Twente durchgeführt.

Selbstmitgefühl ist in den letzten Jahren häufig im Fokus von Forschungen gewesen. Es kann kurz beschrieben werden als die Fähigkeit sich selber in schwierigen Situationen oder Versagen mit Verständnis und Freundlichkeit zu begegnen. Das Ziel dieser Studie ist es Einsichten zu gewinnen in die Beziehung von Selbstmitgefühl, physischer Gesundheit und anderen Gesundsheitsverhalten. Die Durchführung des Fragebogens bedarf circa 20 Minuten. Die Daten werden anonym aufbewahrt und lediglich für Forschungszwecke von den oben aufgelisteten Forschern und den beaufsichtigenden Mitarbeitern Dr. C.H.C. Drossaert und Dr. N. Köhle verwendet.

Ihre Teilnahme an der Studie ist freiwillig und Sie können die Studie zu jeder Zeit abbrechen. Falls Sie Fragen bezüglich der Studie haben, zögern Sie bitte nicht uns unter den unten angegebenen E-Mail Adressen zu kontaktieren.

Sofern sind keine Folgen und Risiken der Studie bekannt, jedoch, wie mit jeglicher Aktivität die im Internet vollzogen wird, ist ein Risiko möglich. Allerdings versichern wir Ihnen hiermit, dass Ihre Daten vertraulich behandelt werden.

Vielen Dank für Ihre Teilnahme,

Maja Kalkofen (m.kalkofen@student.utwente.nl)

Sophia Bauhuf (s.bauhuf@student.utwente.nl)

Hannah Honsel (h.honsel@student.utwente.nl)

Marlene Dahm (a.m.dahm@student.utwente.nl)

Seite 2: Einverständniserklärung - Deutsch:

Selbstmitgefühl repräsentierte häufig den Fokus von Nachforschungen welche über die letzten Jahre hinweg ausgeführt wurden. Es kann als die Fähigkeit bezeichnet werden, in der man während schwierigen Situation und eigenem Versagen, mit Verständnis und Freundlichkeit gegenüber sich selbst reagiert. Die folgende Studie fokussiert sich auf die Verbindung zwischen Selbstmitgefühl und verschiedenen Gesundheitsverhalten. Die Antworten dieser Studie werden anonym auf einem gesicherten Server der Universität Twente gespeichert und zu Analyse-Zwecken, wissenschaftlichen Veröffentlichungen und Präsentation verwendet. Es ist wichtig zu erwähnen, dass Sie keine falschen Antworten geben können. Die Forscher sind interessiert wie Sie das Konzept Selbstmitgefühl und dessen Verbindung zu verschiedenen Gesundheitsverhalten wahrnehmen. Dadurch möchten wir Sie ermutigen die folgenden Fragen wahrheitsgemäß zu beantworten.

- 'Hiermit erkläre ich, dass ich auf einer mir verständlichen Weise über die Natur und Methode der oben genannten Nachforschung aufgeklärt wurde.
- Meine Fragen zu der Studie wurden zu meiner Zufriedenheit beantwortet.
- Ich stimme zu, dass ich freiwillig an dieser Forschung teilnehme.
- Ich habe das Recht meine Einwilligung jederzeit zurück zu ziehen, ohne jeglichen Grund nennen zu müssen und ich bin mir bewusst, dass ich von der Forschung jeder Zeit zurücktreten kann.
- Ich weiß, dass, falls meine Nachforschungsergebnisse in wissenschaftlichen Veröffentlichungen, oder jeglicher anderen Art und Weise veröffentlicht werden, diese komplett anonymisiert werden und meine Informationen vertraulich behandelt werden.
- Falls ich zum jetzigen Zeitpunkt, oder in der Zukunft weitere Informationen über diese Nachforschung verlange, habe ich die Möglichkeit Maja Kalkofen (m.kalkofen@student.utwente.nl) zu kontaktieren.'

Indem Sie auf 'Weiter' klicken, stimmen Sie unserer Verwendung Ihrer Daten zu.

Seite 3:

Wie alt sind Sie? [ ]

Mit welchem Geschlecht identifizieren Sie sich?

Weiblich

Männlich

Anders

Welcher Nationalität gehören Sie an?

Deutsch

Niederländisch

Anders, nämlich [ ]

Seite 4:

Welches ist der höchste Schulabschluss den Sie erreicht haben?

Realschulabschluss oder niedrigerer Abschluss

Abitur oder ähnlicher Abschluss (VMBO, HAVO, Athenuem)

MBO

Bachelor Abschluss (e.g. BA, BS,HBO)

Master Abschluss (e.g. MA, MS, M.Ed)

Doktor Abschluss (e.g. PhD, EdD)

Anderer (bitte erläutern Sie)

Welchen Jobstatus haben Sie derzeit?

Vollzeitangestellter (38+ Stunden/Woche)

Teilzeitangestellter (<38 Stunden/Woche)

Arbeitslos

Selbstständig

Student

Auszubildender

Schüler

Rentner

Nicht in der Lage zu arbeiten

Anders, nämlich [   ]

Leiden Sie unter chronischen Krankheiten?

Nein

Ja, nämlich ___

Haben Sie körperliche Einschränkungen?

Nein

Ja, nämlich ____

Die folgenden Fragen versuchen herauszufinden wie Sie mit sich selbst in schwierigen Zeiten umgehen. Bitte lesen Sie jede Aussage sorgfältig durch, bevor Sie antworten. Kreuzen Sie bei jeder Aussage an, wie oft Sie sich in der beschriebenen Art und Weise verhalten.

Fast nie   Fast immer

1   2   3   4   5

1. Wenn ich bei etwas versage was mir wichtig ist, werde ich von Gefühlen der Unzulänglichkeit aufgezehrt.

2. Ich versuche verständnisvoll und geduldig gegenüber jenen Zügen meiner Persönlichkeit zu sein, die ich nicht mag.

3. Wenn etwas Unangenehmes passiert, versuche ich einen ausgewogenen Überblick über die Situation zu erlangen.

4. Wenn es mir schlecht geht, neige ich dazu zu glauben, dass die meisten anderen Menschen wahrscheinlich glücklicher sind als ich.

5. Ich versuche, meine Fehler als Teil der menschlichen Natur zu sehen.

6. Wenn ich eine sehr schwere Zeit durchmache, schenke ich mir selbst die Zuwendung und Einfühlsamkeit, die ich brauche.

7. Wenn mich etwas aufregt, versuche ich meine Gefühle im Gleichgewicht zu halten.

8. Wenn mir etwas für mich Wichtiges misslingt, glaube ich oft, dass nur ich allein versage.

9. Wenn ich mich niedergeschlagen fühle, neige ich dazu nur noch auf das zu achten, was nicht in Ordnung ist.

10. Wenn ich mich auf irgendeine Art unzulänglich fühle, versuche ich mich daran zu erinnern, dass die meisten Leute solche Gefühle der Unzulänglichkeit haben.

11. Ich missbillige und verurteile meine eigenen Fehler und Schwächen.

12. Ich bin intolerant und unduldsam gegenüber denjenigen Seiten meiner Persönlichkeit, die ich nicht mag.

Markieren Sie die Nummer für jede Aussage, die am besten beschreibt wie sehr Sie von einem bestimmten Problem in den letzten zwei Wochen geplagt wurden. Markieren Sie nur eine Nummer für jede Aussage. Das eine Extrem ist 0, welches aussagt dass sie nicht von dem beschriebenen Problem geplagt werden. Das andere Extrem, 4, sagt aus, dass Sie sehr stark von dem Problem geplagt werden.

In den letzten zwei Wochen (heute eingeschlossen) wie sehr wurden Sie geplagt von:

1. ...Schlafproblemen (unfähig einzuschlafen, aufwachen   0   1   2   3   4

mitten in der Nacht oder früh am Morgen)?

2. ...Gewichtsschwankungen (Zunahme oder Abnahme   0   1   2   3   4

von 2,5 Kilo oder mehr) ?

3. ...Rückenschmerzen?   0   1   2   3   4

4. ...Verstopfung?   0   1   2   3   4

5. ...Schwindel?   0   1   2   3   4

6. ...Durchfall?   0   1   2   3   4

7. ...Schwächeanfall?   0   1   2   3   4

8. ...konstante Müdigkeit?   0   1   2   3   4

9. ...Kopfschmerzen?   0   1   2   3   4

10. ...Migräne?   0   1   2   3   4

11. ...Übelkeit und/oder Erbrechen?		0	1	2	3	4
12. ...Sodbrennen oder Magenverstimmungen?	0	1	2	3	4	
13. ...Bauchschmerzen (z.B. Krämpfe)?	0	1	2	3	4	
14. ...heißen oder kalten Schauern?		0	1	2	3	4
15. ...Händezittern?		0	1	2	3	4
16. ...Herzklopfen- oder rasen?	0	1	2	3	4	
17. ...schwachem Appetit?		0	1	2	3	4
18. ...Kurzatmigkeit ohne Sport oder harte Arbeit zu leisten?		0	1	2	3	4
19. ...Benommenheit oder Kribbeln in manchen Körperteilen?	0	1	2	3	4	
20. ...Schwächegefühl am ganzen Körper?		0	1	2	3	4
21. ...Schmerzen im Herz oder Brustkorb?		0	1	2	3	4
22. ...wenig Energie haben?		0	1	2	3	4
23. ...stickigem Kopf oder Nase?		0	1	2	3	4
24. ...verschwommenem Sehen?		0	1	2	3	4
25. ..Muskel Spannungen- oder Schmerzen?		0	1	2	3	4
26. ...Muskelkrämpfen?	0	1	2	3	4	
27. ...starke Schmerzen?	0	1	2	3	4	
28. ...Akne?		0	1	2	3	4
29. ...Hämatomen?		0	1	2	3	4
30. ...Nasenbluten?		0	1	2	3	4
31. ...gezerrten (angespannte) Muskeln?	0	1	2	3	4	
32. ...gezerrten (angespannte) Bändern?	0	1	2	3	4	
33. ...Schnupfen oder Husten?	0	1	2	3	4	

Dies ist das Ende der Befragung! Vielen Dank für Ihre Teilnahme!

Wenn Sie über die Ergebnisse informiert werden möchten, hinterlassen Sie bitte eine E-Mail Adresse: _____

(bitte bemerken Sie, dass diese E-Mail auf Grund von Privatsphäre seperat von Ihren Daten gespeichert wird)

B: English questionnaire

Invitation letter:

Welcome!

You are being invited to participate in a research study about self-compassion and health behaviours. This study is being conducted by Marlene Dahm, Sophia Bauhuf, Hannah Honsel and Maja Kalkofen from the Faculty of Behavioural, Management and Social Sciences at the University of Twente.

Self-compassion has been the focus of much research conducted over the last years. It can briefly be described as the skill to encounter difficult situations or failure with understanding and kindness for oneself. The purpose of this research study is to gain more insights into the relationship between self-compassion, physical health and health behaviours and it will take you approximately 20 minutes to complete. The data will be stored anonymously and will be used for research purposes only by the aforementioned researchers, as well as the supervising staff of Dr. C.H.C. Drossaert and Dr. N. Köhle.

Your participation in this study is entirely voluntary and you can withdraw at any time. You are free to omit any questions by contacting any of the below provided e-mail addresses.

We believe there are no known risks associated with this research study; however, as with any online related activity the risk of a breach is always possible. We hereby assure that your answers in this study will remain confidential.

Thank you for your participation,

Maja Kalkofen (m.kalkofen@student.utwente.nl)

Sophia Bauhuf (s.bauhuf@student.utwente.nl)

Hannah Honsel (h.honsel@student.utwente.nl)

Marlene Dahm (a.m.dahm@student.utwente.nl)

Page 2: Informed Consent

Self-compassion has been the focus of much research conducted over the last years. It can briefly be described as the skill to encounter difficult situations or failure with understanding and kindness for oneself. This current study focuses on the connection of self-compassion with physical health and different health behaviours. Your answers on this questionnaire will be stored anonymously on a secured server of the University of Twente and will be used for analysis and/or scientific publications/presentations.

It is important to mention that you cannot give any wrong answers. The researchers are interested in how you experience the concept of self-compassion and its connection to various health behaviours. Therefore, we encourage you to answer the questions truthfully.

- 'I hereby declare that I have been informed in a manner which is clear to me about the nature and method of the research as described in the introduction.
- My questions, if any, have been answered to my satisfaction.
- I agree of my own free will to participate in this research.
- I reserve the right to withdraw this consent without the need to give any reason and I am aware that I may withdraw from the research at any time.
- I know that if the results of this study are to be used in scientific publications or made public in any other manner, then they will be made completely anonymous and my information will be kept confidential.
- If I request further information about the research, now or in the future, I may contact Maja Kalkofen (m.kalkofen@student.utwente.nl)'

By clicking the 'next' button, you are giving you agree to the conditions.

Page 3:

How old are you? [   ]

Which gender do you identify with?

Female

Male

Other

What is your nationality?

German

Dutch

Different, namely [ ]

Seite 4:

What is the highest degree you earned?

Less than a high school diploma

High school graduate, diploma or the equivalent (e.g. VMBO, HAVO, Athenuem, Abitur)

MBO

Bachelor's degree (e.g. BA, BS, HBO)

Master's degree (e.g. MA, MS, MEd)

Doctorate degree (e.g. PhD, EdD)

Others (please specify)

What is your current employment status?

Full-time employee (38+ hours/week)

Part-time employee (<38 hours/week)

Unemployed

Self-employed

Student

Trainee

Still in school

Retired

Other, namely [   ]

Are you suffering from a chronic disease?

No

Yes, namely ___

Do you have any physical handicaps?

No

Yes, namely _____

Questionnaire

The following questions are concerned with how you act towards yourself in difficult times. Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost   never   Almost
always

| 1 | 2 | 3 | 4 | 5 |

_____1. When I fail at something important to me I become consumed by feelings of inadequacy.

_____2. I try to be understanding and patient towards those aspects of my personality I don't like.

_____3. When something painful happens I try to take a balanced view of the situation.

_____4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____5. I try to see my failings as part of the human condition.

_____6. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____7. When something upsets me I try to keep my emotions in balance.

_____8. When I fail at something that's important to me, I tend to feel alone in my failure

_____9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____11. I'm disapproving and judgmental about my own flaws and inadequacies.

_____12. I'm intolerant and impatient towards those aspects of my personality I don't like.

Finally, some questions about your physical health. Please, mark the number for each statement that best describes how much that problem has bothered or distressed you <u>during the past two weeks including today</u>. Mark only one number for each item. At one extreme, 0 means that you have not been bothered by the problem. At the other extreme, 4 means that the problem has been an extreme bother.

In the past 2 weeks (including today), how much were you bothered by……:

1. ..sleep problems (can't fall asleep, wake up in middle   0   1   2   3   4

of night or early in morning)?

2. …weight change (gain or loss of 5 lbs. or more)?   0   1   2   3   4

3. …back pain?   0   1   2   3   4

4. …constipation?   0   1   2   3   4

5. …dizziness?   0   1   2   3   4

6. …diarrhea?   0   1   2   3   4

7. ...faintness?   0   1   2   3   4

8. ...constant fatigue?   0   1   2   3   4

9. ...headache   ?   0   1   2   3   4

10. ...migraine headache?   0   1   2   3   4

11. ...nausea and/or vomiting?   0   1   2   3   4

12. ...acid stomach or indigestion?   0   1   2   3   4

13. ...stomach pain (e.g., cramps)?   0   1   2   3   4

14. ...hot or cold spells?   0   1   2   3   4

15. ...hands trembling?   0   1   2   3   4

16. ...heart pounding or racing?   0   1   2   3   4

17. ...poor appetite?   0   1   2   3   4

18. ..shortness of breath when not exercising or   0   1   2   3   4

working hard?

19. ...numbness or tingling in parts of your body?   0   1   2   3   4

20. ...felt weak all over?	0	1	2	3	4
21. ...pains in heart or chest?		0	1	2	3	4
22. ..feeling low in energy?		0	1	2	3	4
23. ...stuffy head or nose?		0	1	2	3	4
24. ...blurred vision?		0	1	2	3	4
25. ...muscle tension or soreness?		0	1	2	3	4
26. ...muscle cramps?		0	1	2	3	4
27. ...severe aches and pains?	0	1	2	3	4
28. ...acne?		0	1	2	3	4
29. ...bruises?		0	1	2	3	4
30. ...nosebleed?		0	1	2	3	4
31. ...pulled (strained) muscles?	0	1	2	3	4
32. ...pulled (strained) ligaments?		0	1	2	3	4
33. ...cold or cough?		0	1	2	3	4

This is the end of the questionnaire! Thank you very much for your participation!

If you want to be informed about the results, please indicate your e-mail here:

_____

(note that for reasons of privacy this email address will be stored separately from your data)