

**Masterthesis**

Sarah El Bataioui (2706482)

University of Twente, Department of Psychology, Health and Technology

**Fluctuations of Self-compassion in the daily life of recently diagnosed treatable cancer patients: An Experience Sampling Study**

Stans Drossaert

Lean Kramer

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## Abstract

**Background:** A recent cancer diagnosis presents the patient with many physical and psychological challenges. Self-compassion can be viewed as an internal resource that enables one to respond to difficulties with kindness and wise, caring responses and has shown to provide various psychological benefits.

**Objective:** This study is a first attempt to fill the gap in current research and to gain further insight into the diurnal fluctuations of self-compassion. It is particularly important to examine not only group fluctuations in self-compassion, but also individual fluctuations, which, unlike mood, have not received sufficient attention in research.

**Method:** The experience sampling method (ESM) was used for data collection. 34 recently diagnosed treatable cancer patients reported their levels of self-compassion, self-criticism, positive mood, and negative mood four times a day for seven days. A descriptive analysis, different visualisation methods to explore the variability of the data and linear mixed models (LMM) were computed using IBM SPSS Statistics 28.

**Results:** At the group level, results suggest no longitudinal nor diurnal variation in self-compassion. However, at the individual level, there were large differences in longitudinal fluctuations, but also no diurnal fluctuations. The LMM showed significant overall associations between self-compassion, and positive mood ( $\beta = 0.529$ ,  $p = <.001$ ) and significant negative associations between self-compassion, and negative mood ( $\beta = -0.361$ ,  $p = <.001$ ).

**Conclusion:** The results indicate that there are significant association between self-compassion and mood on the group level. Longitudinal and diurnal fluctuations on the group level were not observed, however, the visual analyses indicated strong longitudinal fluctuations for some individuals. Future research is needed to further investigate the longitudinal and diurnal fluctuations to gain a more holistic understanding of the underlying mechanisms of self-compassion.

## Content

<b>Abstract</b> .....	2
<b>Introduction</b> .....	4
<b>Self-compassion</b> .....	4
<b>Longitudinal fluctuations</b> .....	4
<b>Daily fluctuations</b> .....	5
<b>Individual fluctuations</b> .....	5
<b>Self-compassion and mood in long-term illnesses</b> .....	6
<b>Purpose of the current study</b> .....	7
<b>Method</b> .....	7
<b>Design</b> .....	7
<b>Setting</b> .....	8
<b>Procedure and response in the ESM study</b> .....	9
<b>Questionnaires</b> .....	9
<b>Data analysis</b> .....	10
<b>Results</b> .....	11
<b>Demographic Statistics</b> .....	11
<b>Longitudinal fluctuations</b> .....	12
<b>Diurnal fluctuations</b> .....	13
<b>Individual longitudinal of self-compassion</b> .....	14
<b>Individual diurnal of self-compassion</b> .....	15
<b>Association between the variables self-compassion, positive mood, self-criticism, and negative mood</b> .....	17
<b>Discussion</b> .....	18
<b>Strengths and Limitations</b> .....	19
<b>Future Research</b> .....	20
<b>Conclusion</b> .....	20
<b>References</b> .....	21
<b>Appendix</b> .....	28

## **Introduction**

As one of the most prevalent diseases, 123 672 new cases of cancer were registered in the Netherlands in 2021 alone (IKNL, 2022). A recent cancer diagnosis presents many challenges to the patient. The ongoing and exhaustive medical procedures, the various symptoms of the disease, and the impact of symptoms such as loss of energy, chronic pain, and sleep problems (Dekker & de Groot, 2018; Stark et al., 2012) have a major impact on a person's life. In response to the challenges of living with a long-term physical illness such as cancer, many people report blaming themselves for their perceived role in causing or exacerbating their illness, and this self-blame can lead to even greater suffering (Callebaut et al., 2017). Patients must therefore accept, cope with, and self-manage their condition, integrating it into their lives and developing a new identity (Ambrosio et al., 2015).

## **Self-compassion**

One approach that may help cancer patients self-manage these challenges is self-compassion. For patients who tend to be overly critical of themselves (Vlierberghe, 2019), self-compassion has been shown to help reduce self-criticism (Campos et al., 2012; Neff et al., 2007). The concept of self-compassion is of growing interest in mental health research, as self-compassion has been associated with numerous mental health benefits (Ferrari et al., 2019). Self-compassion can be viewed as an internal resource that enables one to respond to difficulties with kindness and wise, caring responses (Neff 2003a, 2003b, 2007).

According to Neff, it consists of three interacting elements, namely self-love, compassion, and mindfulness. The self-love dimension involves being gentle and understanding with oneself when confronted with painful experiences, rather than reacting with anger or frustration when something does not go as expected. Common humanity is the sense that suffering is part of the human experience that all people go through. To acknowledge this and accept our shortcomings is to acknowledge the common human experience. Relating one's own experience to that of others who are suffering helps to bring one's own situation into greater perspective. One learns to become non-judgmental and to observe one's own thoughts and feelings. Mindfulness means becoming aware of and acknowledging each experience equally, whether it is a joyful or a painful one.

## **Longitudinal fluctuations**

A trait is a way a person is likely to respond often or almost always. In contrast, a state is the way a person would react or respond in a specific and spontaneous situation. Thus, the

second state tends to be fluctuating and not lasting, whereas the first state is a more constant and stable way of reacting and responding that can withstand change (Epstein 1984) and is related to a person's personality (Hamaker et al., 2007). Hamaker et al. (2007) showed that both contribute to the construct of self-compassion. Although there is a growing interest in self-compassion, few longitudinal studies of self-compassion are available.

While the traits of self-compassion and their associations with psychological traits such as coping and self-criticism have been widely examined in research (Allen & Leary, 2010; Ewert et al., 2021; Neff et al., 2005), there are fewer studies examining the state of self-compassion (Chishima et al., 2022). However, to provide evidence on whether intervention-induced changes in self-compassion are successful, it is first necessary to determine the extent to which and whether the measured variable of self-compassion varies. The states of self-compassion need to be examined in detail to gain a better understanding of the mechanisms underlying the changes in self-compassion.

### **Daily fluctuations**

According to the Diagnostic and Statistical Manual, 5th edition (American Psychiatric Association, 2013), mood swings that exhibit more negative mood in the morning than in the evening are a symptom of melancholic features of major depression (Morris et al., 2009). The diurnal patterns of self-compassion have not received attention in research. To my knowledge, there is no research examining fluctuations in self-compassion across the day. This study is a first attempt to fill the gap in current research and to gain further insight into the diurnal fluctuations of self-compassion.

### **Individual fluctuations**

The experiences of cancer patients are very individual and changes in mood vary not only personally but also contextually and depending on the time of the day. Some patients may suffer from depression and anxiety immediately after being diagnosed, while others may experience mood swings sometime during the treatment (Cardoso et al., 2016).

Kelly et al., 2021 found that nearly half of the variance of self-compassion in their sample of women with anorexia nervosa, occurred at the within-persons daily level, yet at this point, very few studies are known that have investigated within-person fluctuations in self-compassion. Therefore, it is particularly important to examine not only group fluctuations in self-compassion, but also individual fluctuations, which, in contrast to mood, have not yet received sufficient attention in research.

## **Self-compassion and mood in long-term illnesses**

Emotional distress following a recent cancer diagnosis is widespread (Derogatis et al., 1983; Farber et al., 1984; Stefanek et al., 1987), with one-third of a large sample of cancer patients reporting significant symptoms of depression or anxiety (Zabora et al., 1997). There is an increased risk for lower emotional well-being (Heinze et al., 2015), depression, and anxiety (Clarke & Currie, 2009; Patten, 2001), which can further complicate adjustment to long-term illness and increase symptom burden (Katon & Ciechanowski, 2002). This also brings with it a number of psychological effects, such as anxiety and depressive symptoms, as well as avoidance of physical activity (Kwakkenbos et al., 2014; KWF, 2018; Glaus et al., 1996; Bukberg et al., 1984). In a group of early breast cancer patients, Love et al. (2002) found that 36% of them met criteria for depressive disorders shortly after diagnosis.

Some studies have already shown that self-compassion correlates positively with well-being and negatively with distress, negative mood, and psychological symptoms such as depression, anxiety, and stress (Barnard & Curry, 2011; Ehret et al, 2014; Ehret et al, 2018; Hofmann et al, 2012; MacBeth & Gumley, 2012; Muris et al, 2016; Johnson & O'Brien, 2013). A recent study examined the relationship between self-compassion and positive and negative mood (Neff et al., 2021) and found that self-compassion had a strong positive relationship with positive mood and a strong negative relationship with negative mood. Previous research has shown that self-criticism and negative mood are also strongly related (Zuroff et al., 1990; Manfredi et al., 2016). Self-compassion, on the other hand, appears to be negatively related to depressive and anxiety symptoms in cancer patients, with perceived future cancer-related symptoms associated with future symptoms of depression, anxiety, and fatigue (Zhu et al., 2020). A major shortcoming of all these studies is that they all measure self-compassion and mood only at one point in time, although both mood and self-compassion may not be stable traits but fluctuate over time.

Studies such as that of Neff and Germer (2013), which showed that a self-compassion training increased self-compassion and improved well-being for up to one year (see also Delaney 2018; Finlay-Jones et al. 2017; and Friis et al. 2016), highlight the urgent need for further research on self-compassion in the context of long-term illness. In patients with low self-esteem, it may also serve as a buffer to protect against psychological distress (Marshall et al., 2015; Neff et al., 2007; Pinto-Gouveia et al., 2014). Self-compassion is also associated with lower distress (Costa & Pinto-Gouveia, 2013; Friis et al, 2015; Pinto-Gouveia et al, 2014), higher health-related quality of life (Brion et al, 2014; Dewasaran-van der Ven et al, 2018; Nery-Hurwit et al, 2018; Pinto-Gouveia et al, 2014), adaptive coping (Sirois et al, 2015), emotion

regulation (Trompetter et al, 2017), reduced feelings of shame (Sedighimornani et al. , 2019), health-seeking behaviors (Dunne et al., 2018; Homan & Sirois, 2017), social support seeking (Brion et al., 2014), and treatment adherence (Sirois & Hirsch, 2019) in various long-term ill and healthy populations. Consequently, self-compassion has been shown to be an important resource in coping with the specific challenges of living with a long-term illness such as cancer and should be further explored in terms of clinical implications for the treatment of depressive symptoms in patients with long-term and chronic illnesses.

### **Purpose of the current study**

By investigating longitudinal and diurnal patterns of self-compassion and self-criticism and comparing those to the longitudinal and diurnal patterns of positive mood and negative mood, important implications on the characteristics and how they behave within our present sample, might be added to the currently present research on self-compassion and mood. This could also have important considerations on diagnosis of depression in comorbidity with a long-term or chronic illness. Based on these considerations, this research paper aims to investigate the following research questions:

1. What are the longitudinal fluctuations of self-compassion?
2. What are the diurnal fluctuations of self-compassion?
3. What are the individual fluctuations of self-compassion?
4. What are the associations between the variables self-compassion, self-criticism, positive mood, and negative mood?

## **Method**

### **Design**

To answer these research questions, the Experience Sampling method (ESM) was used. With Experience Sampling as an intense longitudinal method, it is possible to perform multiple measurements within a person and analyse correlations between the variables, over a longer period (e.g., several days or weeks) dependent on specific contents. Due to a rapidly ongoing progress in digitalisation, more wearable devices like smartphones, are becoming available to a broader audience (Berkel et al., 2017) and are thus becoming increasingly important in the clinical context as well (Verhagen et al., 2016). EMS overcomes some of the limitations of earlier methods by combining the ecological validity of diary approaches with the rigorous measurement procedures of psychometric research. That is, it records information about both personal insights and objective variables of people's lives, it secures data on behavioural and

intrapsychic aspects of daily activities, and it obtains reports on people's experiences as they occur and minimises the impact of biases on memory and reconstruction (Csikszentmihalyi & Larson, 2014). By repeatedly measuring self-compassion and mood over the course of a week using experience sampling, it is possible to obtain a sufficient sample of these mental states within an individual to systematically examine longitudinal and diurnal fluctuations in daily life, as well as the relationship between the four variables self-compassion, self-criticism, positive and negative mood

## **Setting**

This study was part of a larger research study to evaluate a self-compassion app for cancer patients, where participants (patients recently diagnosed with cancer) were asked if they wanted to try an app that would teach them self-compassion. The app is a 6-week self-compassion training, covering a different self-compassion topic each week. Participants were 49 patients that were recently (with-in 12 months) diagnosed with any treatable cancer. They were recruited from two different hospitals through the oncology nurses, who informed their patients about the intervention. The two participating hospitals were the MST (Medisch Spectrum Twente) in Enschede and the UMCG (Universitair Medisch Centrum Groningen) in Groningen. To be able to participate in this intervention the patients needed to be aged 18 or older and needed to be proficient in Dutch, have a Smartphone, computer, or tablet at their disposal, and were willing to try out the app for 2 hours per week and fill in the questionnaires. Participants received a brochure with a QR-code and a web-link that forwarded to the website of the study. By registering for the study through the website, the data of first names, last names, hospital, and phone numbers were collected. After registration, the participants were asked to sign the informed consent where the exclusion questions were asked (Are you 18 years or older?; Are you recently (within 12 months) diagnosed with cancer?; Is your treatment focused on curing?). By answering 'no' to one of these questions, people were excluded to participate in the study. Participants were also informed that participation was voluntary. Participants who agreed to the terms and conditions of the study based on the information letter they received, answered questions about the diagnosis and treatment then they filled in the questionnaires and at the end some demographic questions regarding their age, gender, level of education and relationship status.



## **Procedure and response in the ESM study**

The current study reports on the ESM-part of this larger study. From the 49 patients that participated in the Experience Sampling Study, 15 participants were excluded from this study because they filled in less than 50% of the total amount of questionnaires (28 timepoints). The other 34 were included for the data analysis. Timepoints that were outside of the estimated measurement points were excluded as well but did not affect the number of included participants. For the analysis of the 28 timepoints no timepoint was excluded, since they all had a response rate higher than 50% (more than 17 participants answering to it).

The ESM questions were distributed via the instant messaging app “WhatsApp”. “WhatsApp” was chosen because it was already widely used and participants did not need to familiarise themselves with another new application, and because it can be used in conjunction with the scheduling app “SKEDit”. “SKEDit” allowed us to schedule messages and repeat the messages at a certain time interval. The message contained a short statement and a link to the “Qualtrics survey”. The signal-contingent sampling was used for data collection. A brief, 7-items (Qualtrics) survey was sent out four times a day for seven days (28 time points). The survey was distributed at four different times on each day: morning (09:00 - 11:50), noon (12:10 - 14:50), afternoon (15:10 - 17:50) and evening (18:10 - 21:00). A random number generator (random.org) was used to generate random measurement times within each time slot, resulting in 28 unique timepoints for the distribution. The duration of the ESM questions was set at seven days, with the eighth day used for the debriefing questionnaire. To enhance the motivation to participate, micro-incentives were used, meaning that participants could earn 40 cents for each time they completed the questions. This amount of maximum 28 times 40 cent (11, 20€) was paid to the participant after they have completed at least 60% of the time points (rounded to  $n = 16$  questionnaires) (Musthag, 2011).

## **Questionnaires**

Seven questions were selected for the ESM questionnaire to ensure that answering the questions several times a day was not too challenging for patients and did not lead to participants being overwhelmed if longer and validated constructs were taken from a more extensive survey. Positive mood was measured with the items “I feel cheerful at this moment”, “I feel calm at this moment”, and “I feel physically well at this moment”. Negative mood was measured with the items “I feel anxious at this moment”, and “I feel sad at this moment”. Positive self-compassion was measured with the item “At this moment I feel kind towards

myself” and negative self-compassion was measured with the item “At this moment I am self-critical”. The constructs were based on the Profile of Mood States Questionnaire (POMS), due to the lack of standardised ESM item sets with evidence-based psychometric criteria (Haynes & Yoshioka, 2007). Cronbach’s Alpha of the 2-items negative mood scale was 0.732 and the Alpha of the 3- items positive mood scale was merely 0.687. The item “I feel physically well at this moment”, had fewer ties with the concept of positive mood than the other 2 items from the positive mood scale. Without this item Cronbach’s alpha for the positive mood scale would reach acceptability with 0.713. Therefore, the item “I feel physically well at this moment” was excluded and only the items “I feel cheerful at this moment” and “I feel calm at this moment” were computed for positive mood. To calculate Cronbach’s Alpha of self-compassion and self-criticism, the self-criticism item was inverted first. Cronbach’s Alpha of the inverted item self-criticism and the item self-compassion scale was low with 0.592, the items self-compassion and self-criticism were therefore analysed separately.

On the 8<sup>th</sup> day participants were given a debriefing questionnaire containing the following questions, the first three could be answered on a 5-point Likert scale from 1 (always) to 5 (never): “Did the daily questions affect your feelings, thoughts, or behaviour?”, “Was the past week a typical week for you?”, and “Did the questions disturb you in your daily activities?”. The last two questions were: “Was the past week a typical week for you?”, and “Did you experience any technical problems with the daily questions?”, these could be answered with “yes” or “no” with the opportunity for the first one, to further explain if stated “no”. These questions were asked to check whether the patients' everyday life was affected in any way by the ESM questions and whether their behaviour, thoughts or feelings were influenced by them (Hormuth, 1986). As recommended by Hektner, Schmidt, & Csikszentmihalyi, (2007) the survey duration was set for one week for the ESM questions. This ensures a representative sample on the one hand and keeps the participant burden low on the other (Csikszentmihalyi & Larson, 2014).

## **Data analysis**

Firstly, the data was prepared by anonymizing the sensitive participant-related data to individual identification numbers, to protect participants’ confidentiality. To analyse the conducted data, it was first cleaned from timepoints that differed more than a day (24 hours) from the determined sampling timepoints. Timepoints were also transformed from the raw form of data collection of date and time to a chronological form ranging from 1 (first data timepoint on day one, first timepoint) to 28 (last day, fourth timepoint). Due to the shortness of the ESM

questionnaire, only the total scores and not the subscale scores of the positive mood and negative mood items were used.

The 28<sup>th</sup> edition of the Statistical Program for Social Sciences (SPSS) was used for all analyses and illustrations. Descriptive statistics were then calculated to evaluate the demographic variables age, gender, relationship status, current main occupation, and level of education, as well as of the variables self-compassion, positive mood, self-criticism, and negative mood and presented in tables. To answer the current research questions, different visualisation methods were used to explore the variability of the data. This study also used a series of linear mixed models (LMM) with a first-order autoregressive (AR1) covariance structure for the repeated measures to account for missing values and the possible higher correlation between closer time points, as it can handle the complexity of longitudinal data, e.g., missing data, unevenly distributed time points or time-varying covariates, which other classical methods cannot (Myin-Germeys & Kuppens, 2021). For each LMM, the time points were set as repeated measures and the ID of the participant as the subject. To answer the fourth research question, an LMM was conducted with negative mood as the dependent variable and self-compassion and self-criticism as fixed covariates. The same was repeated with positive mood as the dependent variable and self-compassion and self-criticism as fixed covariates. A significance level of 0.05 (5 %) was chosen.

## **Results**

### **Demographic Statistics**

The descriptive statistics of the demographic variables are shown in the table 1. With an age range of 22 to 74 years and an average age of 54, the present sample is representative of the population. The participants were predominantly female, were currently in a relationship, were still employed, and had a medium to high level of education. With an average of 23 questionnaires per participant as well as per survey timepoint, the response rate of the participants was satisfactory.

**Table 1.***Demographic Statistics*

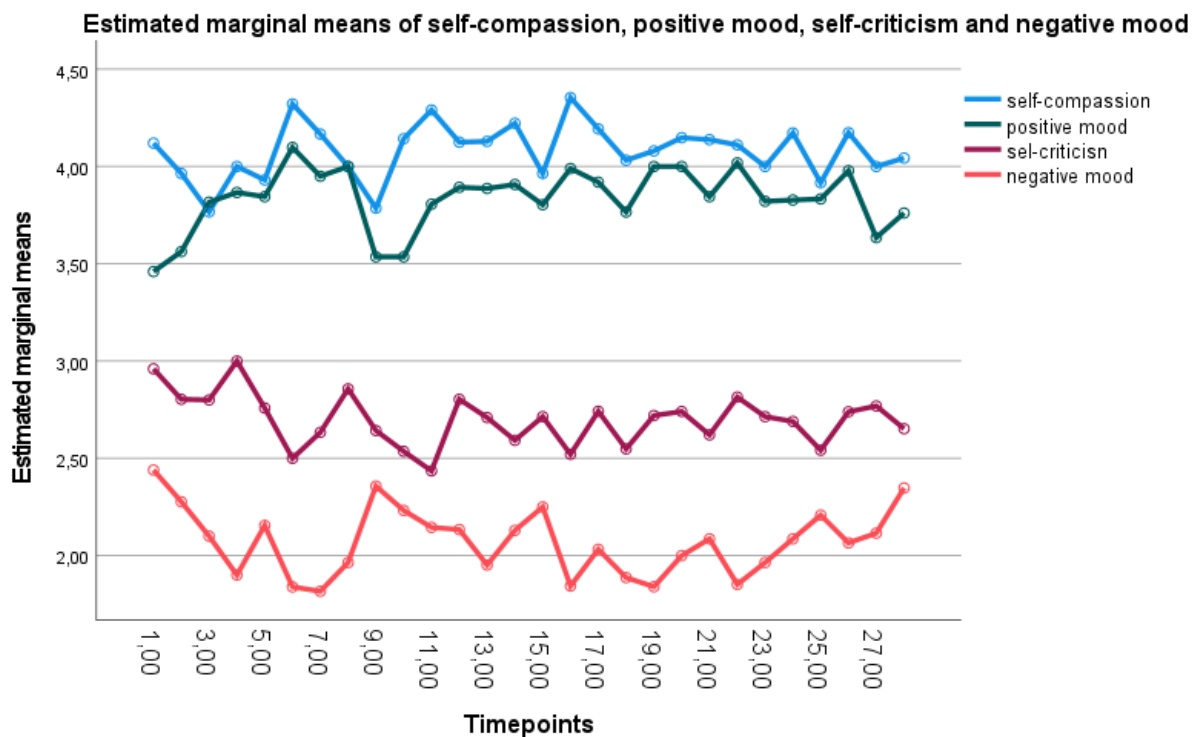
	Minimum	Maximum	Mean	SD
Age	22	74	54.08	11.55
Female			27	
Male			7	
In a relationship			29	
Not in a relationship			5	
Still working			15	
Retired			5	
Stay at home parent			4	
On sick leave			8	
Unemployed by illness not caused by cancer			2	
No education			1	
Lower level of education			6	
Medium level of education			10	
High level of education			17	
Answers per Timepoint	23	31	22.71	
Answers per Participant	14	28	22.82	

*N* = 34

**Longitudinal fluctuations**

Figure 1 shows the standardized values for self-compassion of all participants for all 28 time points. Visual inspection shows at the group level, no strong variability in self-compassion over time. Of the four reported variables, self-compassion was reported highest at all time points, followed shortly by positive mood with less than one value below self-compassion at all time points. This is followed with some distance by self-criticism and then again followed by negative mood. The patterns of self-compassion and positive mood begin to develop in opposite directions at the first three time points, but then show a very similar pattern and frequently switch their direction at the same time point. Relatively similar patterns are also observed for self-criticism and negative mood. At two time points (18 & 21) we see that self-criticism increases and negative mood follows one time point later (19 & 22). After time point 23, the variables begin to behave in opposite directions.

**Figure 1.**

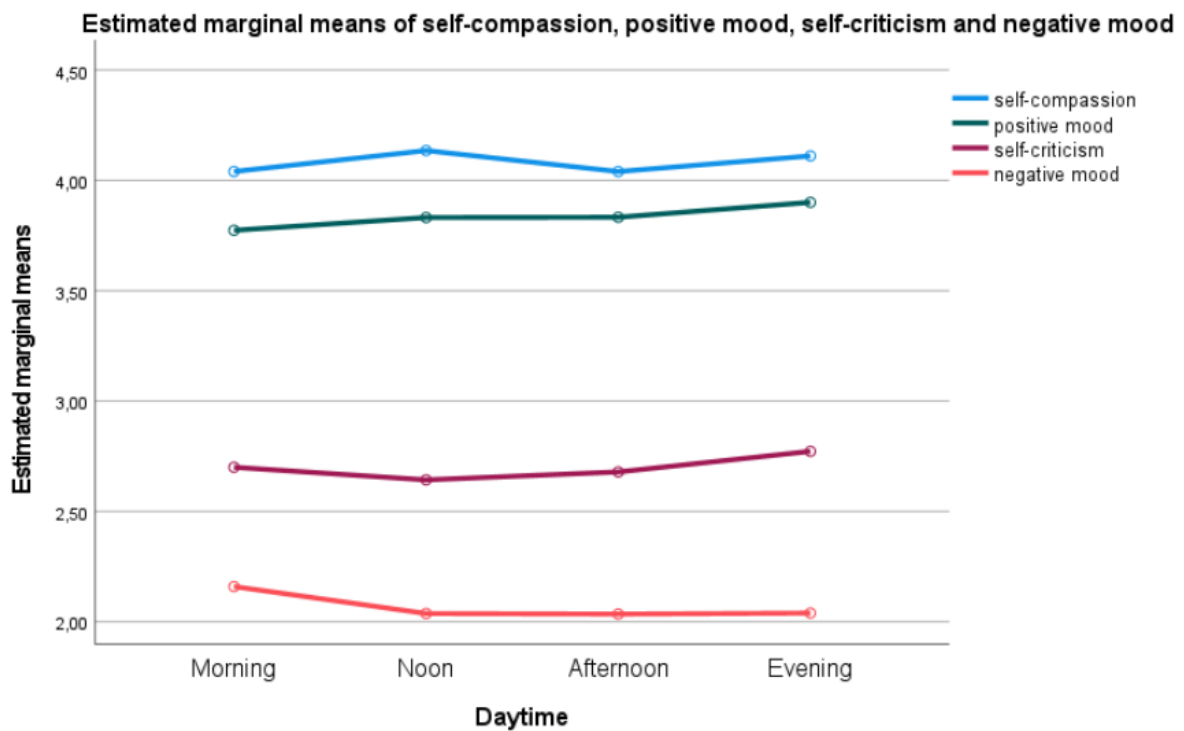


$N = 34$

### **Diurnal fluctuations**

Overall self-compassion was reported the highest for all four daytimes with positive mood following. Negative mood was reported the lowest with self-criticism reported moderately higher. Visual inspection of Figure 2 shows that all four variables show low fluctuations throughout the day. Self-compassion and positive mood scores slightly increased after the morning but stayed relatively stable throughout the day. Self-criticism and negative mood scores slightly decreased after the morning. Self-criticism increased again toward the evening while negative mood stayed at the same level.

**Figure 2.**



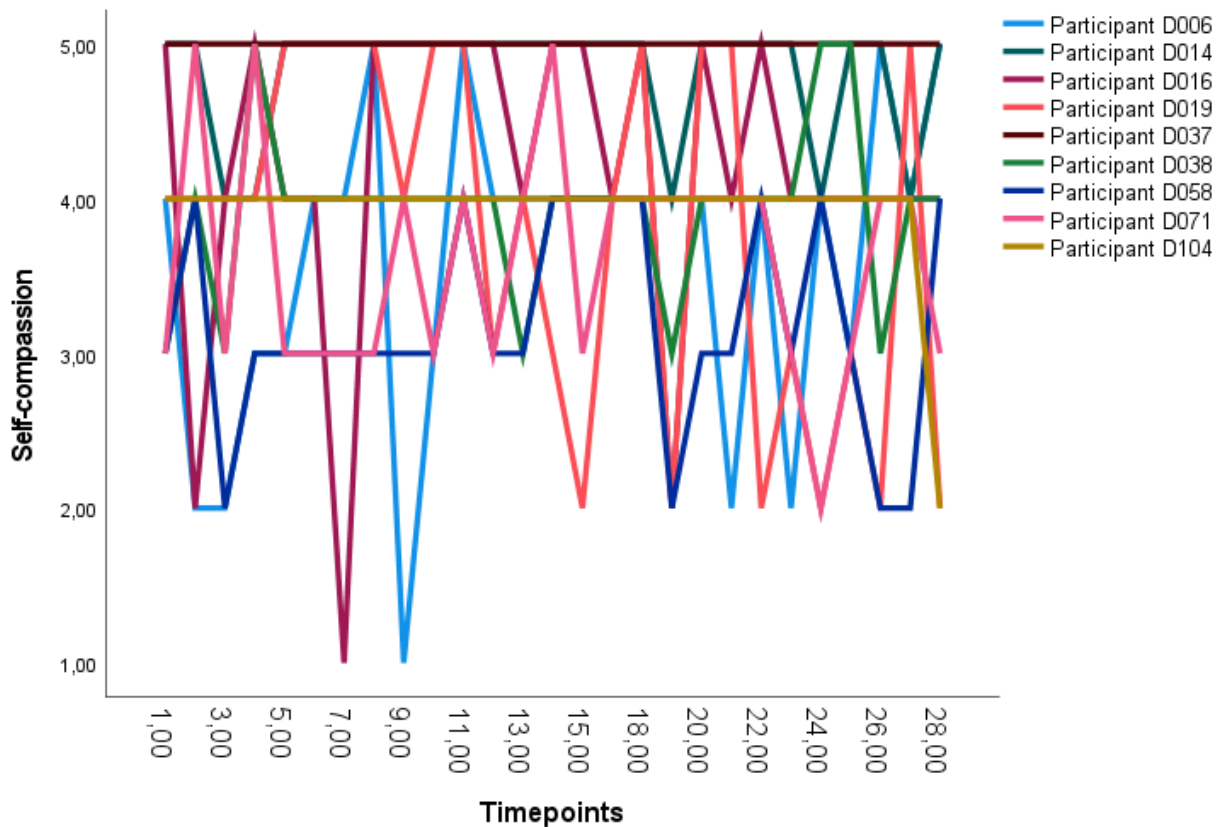
$N = 34$

### **Individual longitudinal of self-compassion**

Individual longitudinal fluctuations for participants who completed 27 or more from the overall 28 timepoints are individually displayed in Figure 3. For better readability, the remaining participants are displayed in the appendix. Visual inspection of longitudinal fluctuations revealed that Participant D037 reported the same levels of self-compassion for all 28 timepoints. Participant D104 reported the same levels of self-compassion for 27 timepoints, only decreasing by two points at the 28th measurement timepoint. For the remaining seven of nine participants displayed, the level of self-compassion varied more widely. Participant D058 reported values between two and four, and participant D038 reported values between three and five, showing only moderate fluctuation of self-compassion. Stronger fluctuations, on the other hand, were seen in Participant D014, D019, and D071 who reported values of self-compassion between two and five, and Participant D006 and Participant D016 even reported values of self-compassion between one and five, which corresponds to the entire range of the 5-point Likert scale used.

**Figure 3.**

*Individual longitudinal fluctuations for participants that completed all (28) or nearly all (27) timepoints*



$N = 9$

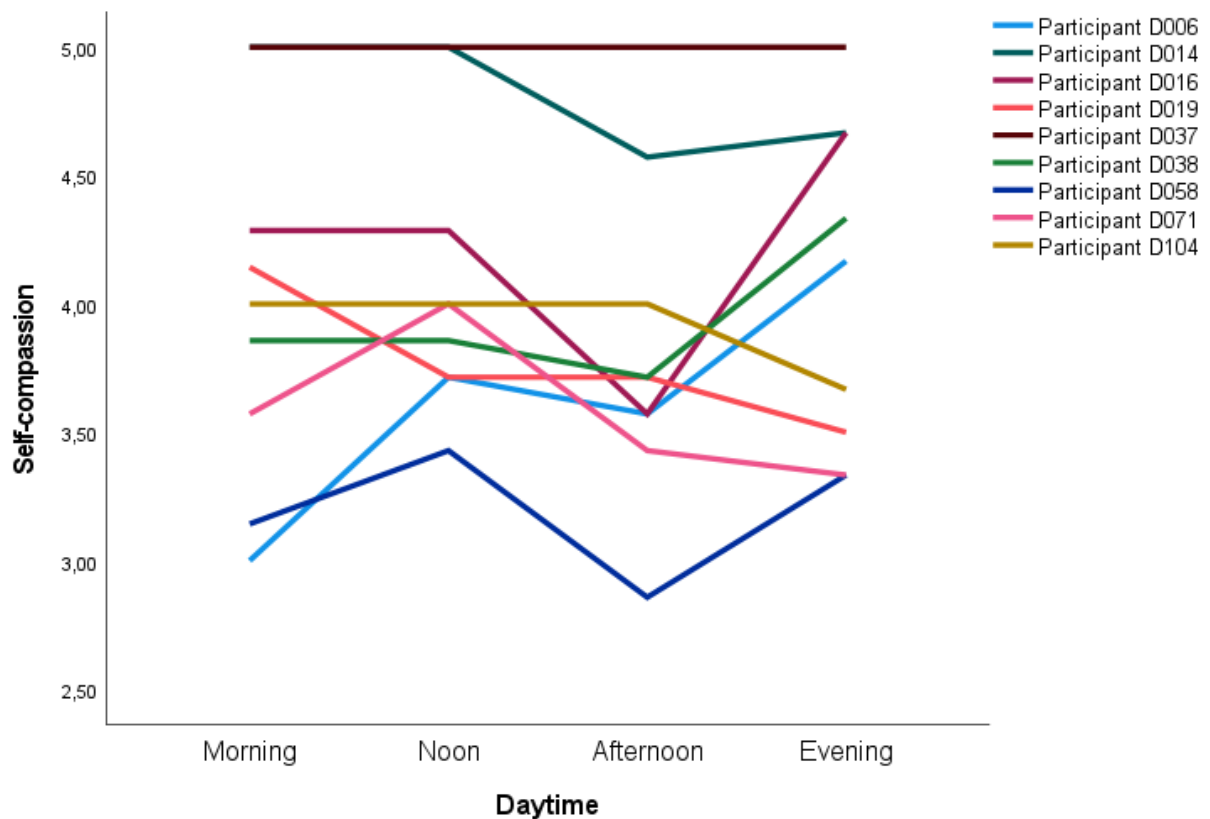
### **Individual diurnal of self-compassion**

Individual diurnal fluctuations for participants who completed 27 or more from the overall 28 timepoints are individually displayed in Figure 4. For better readability, the remaining participants are displayed in the appendix. Visual inspection of the diurnal fluctuations revealed that participant D006 showed the same level of self-compassion throughout the day. Participant D104 also showed the same level of self-compassion in the morning, at noon, and in the afternoon, with only a slight decrease in the evening. For the remaining seven of the nine participants indicated, the level of self-compassion fluctuated slightly more, yet no participant reported fluctuations of more than one score for self-compassion throughout the day. Participant D014 reported a stable level of self-compassion from morning to noon, then a decrease in the afternoon and a slight increase again in the evening. Participant D038 also showed a stable level of self-compassion from morning to noon, then only a slight decrease in the afternoon and a slight increase in the evening. Participant D016 also showed stable levels from morning to noon, then a decrease in the afternoon and an

increase of one point in the evening. Participant D006 showed an increase in self-compassion from morning to noon, then a slight decrease in the afternoon and another slight increase in the evening. Participant D071 also showed a slight increase in self-compassion from morning to noon, then a decrease in the afternoon, and another slight decrease in the evening. Participant D058 also showed a slight increase from morning to noon, then a decrease in the afternoon and another slight increase again in the evening. Only participant D019 showed a decrease in self-compassion from the morning to noon, then remained stable in the afternoon and decreased again in the evening.

**Figure 4.**

*Individual diurnal fluctuations for participants who completed all (28) or nearly all (27) timepoints*



$N = 9$



## Association between the variables self-compassion, positive mood, self-criticism, and negative mood

The descriptive statistics of the main variables Mood, Self-compassion, and their underlying items are shown in table 2. Self-compassion was reported the highest with 4.09 (SD = 0.93), and negative mood was reported the lowest with 1.94 (SD = 1.21). Self-criticism (M = 2.73, SD = 1.32) and positive mood (M = 2.78, SD = 0.76) showed moderate levels. All variables were scored within the entire range of the 5-point Likert scale.

**Table 2.**

*Demographic Statistics of the variables self-compassion, self-criticism, positive mood and negative mood*

Variables	Min.	Max.	Mean	SD
Self-compassion	1	5	4.09	0.93
Self-criticism	1	5	2.73	1.32
Positive mood	1	5	2.78	0.76
Negative mood	1	5	1.94	1.21

*N* = 34

The LMM with negative mood as the dependent variable and self-compassion and self-criticism as the covariates showed significant negative associations between self-compassion and negative mood, but no associations for self-criticism and negative mood (see Table 3).

**Table 3.**

*Estimates of fixed effects of self-compassion and self-criticism on negative mood (N = 34)  
Coefficients slope (b), standard error (SE), z-score ( $\beta$ ), T-Value, and p-Value (95 % CI)*

Covariate	<i>B</i> ( <i>SE</i> )	$\beta$	<i>T</i>	<i>p</i>
Self-compassion	-.429 (.044)	-.361	-9.787	<.001
Self-criticism	.056 (.031)	.067	1.814	.070

*Note.* Dependent variable = negative mood

The LMM with positive mood as the dependent variable and self-compassion and self-criticism as the covariates showed significant overall associations between self-compassion,

and positive mood, as well as significant negative associations between self-criticism and positive mood (see Table 4).

**Table 4.**

*Estimates of fixed effects of self-compassion and self-criticism on positive mood (N = 34)  
Coefficients slope (b), standard error (SE), z-score ( $\beta$ ), T-Value, and p-Value (95 % CI)*

Covariate	<i>B (SE)</i>	$\beta$	<i>T</i>	<i>p</i>
Self-compassion	.564 (.037)	.529	15.061	<.001
Self-criticism	.097 (.026)	-.129	3.675	<.001

*Note.* Dependent variable = positive mood

### Discussion

This study focused on diurnal and longitudinal fluctuations of self-compassion of recently diagnosed treatable cancer patients. Associations between self-compassion, self-criticism, positive mood, and negative mood were also investigated. For this purpose, intensive longitudinal data was collected in daily life through experience sampling.

On the group level, longitudinal fluctuations of self-compassion showed only little variability. There were no diurnal fluctuations of self-compassion on the group level. Individual participant results for longitudinal fluctuations, on the other hand, showed widely varying fluctuation. This could be due to the assumption that each individual handles difficult situations very differently (Cardoso et al., 2016), for instance in terms of differences in the effectiveness of the intervention, or to the degree of compliance in completing the questionnaire among each participant. Individual diurnal fluctuations were only slight, there was no decrease in negative feelings and self-criticism from the morning to the evening, these findings seem to contradict previous findings of Morris et al., 2009 regarding diurnal fluctuations of mood. In the present study, the self-compassion intervention may have served as a buffer by enhancing positive mood on top of protecting against negative mood (Marshall et al., 2015; Neff et al., 2007; Pinto-Gouveia et al, 2014).

Overall, there were significant associations between self-compassion and mood. Significant negative associations of self-compassion and negative mood is consistent with literature that has found self-compassion to correlate negatively with negative affect and positively with positive affect (Barnard & Curry, 2011; Ehret et al., 2014; Hofmann et al., 2012; MacBeth & Gumley, 2012; Muris et al., 2016; Johnson & O'Brien, 2013). There were only

moderate associations between self-compassion and self-criticism. This finding is also consistent with recent literature examining the psychometric properties of the Self-Compassion Scale (SCS), suggesting that the SCS measures the two distinct constructs of self-compassion and self-criticism (Brenner et al., 2017; Costa et al., 2016; Lopez et al., 2015). Future research is needed to further investigate differences of self-compassion and self-criticism and to also examine fluctuations of self-criticism, for a holistic understanding of the underlying mechanisms of self-compassion and self-criticism.

### **Strengths and Limitations**

The greatest strength of this study is the experience sampling method, which allows for an in-depth look at each participant's individual feelings and experiences by conducting it in their natural environment, such as their own home (Runyan et al., 2019). The burden of participation and therefore the experience of additional stress from the measurement is being minimised and shows a truer to nature view on their everyday life (Csikszentmihalyi & Larson, 2014). The intensive measurement also allows better insights into the diurnal and the longitudinal fluctuations. This provides research with more accurate and valuable data for clinical implications (Verhagen et al., 2016). By using linear mixed model analysis for data analyses, it is possible to minimise mistakes from repeated measurements (Myin-Germeys et al., 2018).

In addition, the extent to which this study was conducted provides a relatively large sample size with 34 included participants. An analysis by Berkel et al., 2017 showed that a median of 19 participants, provides a representative insight into common ESM practices. On the other hand, with 15 exclusions out of initially 49 participants, the drop-out rate was relatively high, even though the burden on participants was kept as low as possible. It is possible that the incentives were not attractive enough. Micro-insensitivity may lead to more extrinsic motivation and thus lower reliability Benabou & Tirole (2003). However, it could be argued that the amount of €11.20 does not represent such a large extrinsic motivation that it leads to a decrease in reliability. Furthermore, recent literature suggests that motivation is a much more complex issue than assumed and that the use of incentives therefore depends on more factors than just intrinsic or extrinsic motivation (Barr et al., 2022). Combined with the strict exclusion criteria for missing values, this could lead to less useful data for analysis.

Moreover, a standardised measure is needed that meets these requirements to be a reliable measure of the self-compassion and self-criticism items, and that is also stable to influences that may be a side effect of the disease and therefore capture physical rather than

psychological well-being. The reliability of the measured items could be hindering for further implications regarding interventions with self-compassion for patients who suffer from chronic and long-term illness. The positive mood scale measured the item “I feel physically well at this moment”, which may be a difficult question regarding symptoms cancer patients are experiencing due to the illness itself or even the treatment. This may be a possible reason, why a high Cronbach`s alpha could not be reached with this item included, and therefore needed to be excluded.

### **Future Research**

In addition to the above recommendations, another study could analyze the interaction between the intervention time points and the questionnaire time points, which could provide a statement about a causal relationship between the questionnaire responses and the direct effects of the intervention experiences. To make further implications about fluctuations of self-compassion in the overall population, future research would require a study for participants in a healthy group and, for example, in a group with depression. In addition, it would also be interesting to see in a follow-up study whether patterns of self-compassion change within the same participants. A possible future research question could be: How do fluctuations of self-compassion change over time? A follow-up study of individual fluctuations among participants six months, or a year after the initial ESM study could lead to better insights into longitudinal variation in self-compassion.

### **Conclusion**

The main aim from the present study was to investigate fluctuations of self-compassion in a sample of recently diagnosed treatable cancer patients. On a group level the results suggest no longitudinal or diurnal fluctuations of self-compassion, self-criticism, positive mood, and negative mood. On the individual level however, there were major differences in longitudinal fluctuations, but nevertheless also no diurnal fluctuations. Overall, the results clearly show a significant association between self-compassion and mood, but only a moderate association between self-compassion and self-criticism. This study was a first attempt to gain more insights of the fluctuations of self-compassion. Future research is needed to further investigate differences of self-compassion and self-criticism and to also examine fluctuations of self-criticism, for a holistic understanding of the underlying mechanisms of self-compassion and self-criticism.

## References

- Allen, A. B., & Leary, M. R. (2010). Self-Compassion, Stress, and Coping. *Social and Personality Psychology Compass*, 4, 107-118. <https://doi.org/10.1111/j.1751-9004.2009.00246.x>
- American Psychiatric Association. (2013). Depressive Disorders. In *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi-org.ezproxy.frederick.edu/10.1176/appi.books.9780890425596>
- Ambrosio, L., Senosiain Garcia, J. M., Riverol Fernandez, M., Anaut Bravo, S., Diaz De Cerio Ayesa, S., Ursua Sesma, M. E., Portillo, M. C. (2015). Living with chronic illness in adults: A concept analysis. *Journal of Clinical Nursing*, 24(17-18), 2357–2367. <http://doi:10.1111/jocn.12827>
- Barnard, L. K., & Curry, J. K. (2011). Self-compassion: Concetualisation, correlates, & interventions. *Review of General Psychology*, 15(4), 289-303. <http://doi:10.1037/a002574>.
- Barr, H., Smitherman, R., & Mesmer, B., Weger, K., Van Bossuyt, D., Semmens, R. & Tenhundfeld, N. (2022). Use, Acceptance, and Adoption of Automated Systems with Intrinsic and Extrinsic Motivation Based Incentive Mechanisms. 10.1109/SIEDS55548.2022.9799319.
- Benabou, Roland & Tirole, Jean. (2003). Intrinsic and Extrinsic Motivation. *Review of Economic Studies*. 70. 489-520. <http://doi:10.1111/1467-937X.00253>.
- Berkel-van N., Ferreira D., & Kostakos V. (2017). The Experience Sampling Method on Mobile Devices. *ACM Computing Surveys*. 50. 1-40. 10.1145/3123988.
- Brenner, R. E., Heath, P. J., Vogel, D. L., & Cred e, M. (2017). Two is more valid than one: Examining the factor structure of the Self-Compassion Scale (SCS). *Journal of Counseling Psychology*, 64(6), 696–707. <http://doi:10.1037/cou0000211>.
- Brion, J. M., Leary, M. R., & Drabkin, A. S. (2014). Self-compassion and reactions to serious illness: The case of HIV. *Journal of Health Psychology*, 19(2), 218–229. <http://doi:10.1177/1359105312467391>
- Bukberg, J., Penman, D., & Holland, J. C. (1984). Depression in hospitalized cancer patients. *Psychosomatic medicine* 46(3), 199-212. <http://doi:10.1097/00006842-198405000-00002>.
- Callebaut, L., Molyneux, P., & Alexander, T. (2017). The relationship between self-blame for the onset of a chronic physical health condition and emotional distress: A systematic

- literature review. *Clinical Psychology & Psychotherapy*, 24(4), 965–986.  
<http://doi:10.1002/cpp.206>
- Campos, R. C., Besser, A., Ferreira, R., & Blatt, S. J. (2012). Self-criticism, neediness, and distress among women undergoing treatment for breast cancer: A preliminary test of the moderating role of adjustment to illness. *International Journal of Stress Management*, 19(2), 151.
- Cardoso, G., Graca, J., Klut, C., Trancas, B., & Papoila, A. (2016). Depression and anxiety symptoms following cancer diagnosis: a cross-sectional study. *Psychology, health & medicine*, 21(5), 562-570.
- Csikszentmihalyi, M., & Larson, R. (2014). Validity and Reliability of the Experience-Sampling Method. In: *Flow and the Foundations of Positive Psychology*. Springer, Dordrecht. [https://doi.org/10.1007/978-94-017-9088-8\\_3](https://doi.org/10.1007/978-94-017-9088-8_3)
- Chishima, Y., Sugawara, D., & Mizuno, M. (2022). Supportive evidence for the State Self-Compassion Scale using Japanese samples. *Psychological Assessment*, 34(9), e72–e87. <https://doi.org/10.1037/pas0001144>
- Costa, J., & Pinto-Gouveia, J. (2013). Experiential avoidance and self-compassion in chronic pain. *Journal of Applied Social Psychology*, 43(8), 1578–1591. <http://doi:10.1111/jasp.12107>
- Costa, J., Maroco, J., Pinto-Gouveia, J., Ferreira, C., & Castilho, P. (2016). Validation of the psychometric properties of the Self-Compassion Scale. Testing the factorial validity and factorial invariance of the measure among borderline personality disorder, anxiety disorder, eating disorder and general populations. *Clinical Psychology and Psychotherapy*, 23(5), 460–468. <http://doi:10.1002/cpp.1974>.
- Clarke, D. M., & Currie, K. C. (2009). Depression, anxiety and their relationship with chronic diseases: A review of the epidemiology, risk and treatment evidence. *Medical Journal of Australia*, 190(7), S54–S60. <http://doi:10.5694/j.1326-5377.2009.tb02471.x>
- Dekker, J., & de Groot, V. (2018). Psychological adjustment to chronic disease and rehabilitation—an exploration. *Disability and rehabilitation*, 40(1), 116-120.
- Delaney, M. C. (2018). Caring for the caregivers: Evaluation of the effect of an eight-week pilot Mindful Self-Compassion (MSC) training program on nurses' compassion fatigue and resilience. *PLoS One*, 13(11), e0207261.
- Derogatis LR, Morrow GR, Fetting J (1983) The prevalence of psychiatric disorders cancer patients. *JAMA The Journal of the American Medical Association* 249, 751–757

- Dewsaran-van der Ven, C., Van Broeckhuysen-Kloth, S., Thorsell, S., Scholten, R., De Gucht, V., & Geenen, R. (2018). Self-compassion in somatoform disorder. *Psychiatry Research, 262*, 34–39. <http://doi:10.1016/j.psychres.2017.12.013>
- Dunne, S., Sheffield, D., & Chilcot, J. (2018). Brief report: Self-compassion, physical health and the mediating role of health-promoting behaviours. *Journal of Health Psychology, 23*(7), 993–999. <http://doi:10.1177/1359105316643377>
- Ehret, A. M., Joormann, J., & Berking, M. (2014). Examining risk and resilience factors for depression: The role of self-criticism and self-compassion. *Emotion and Cognition, 29*(8), 1496-1504. <http://doi:10.1080/02699931.2014.992394>.
- Ehret A. M., Joormann J, Berking M. (2018). Self-compassion is more effective than acceptance and reappraisal in decreasing depressed mood in currently and formerly depressed individuals. *Journal of Affective Disorders 226*, 220-226. <http://doi:10.1016/j.jad.2017.10.006>.
- Epstein, S. (1984). The stability of behavior across time and situations. In R. A. Zucker, J. Aronoff, & A. I. Rabin (Eds.), *Personality and the prediction of behavior*.
- Ewert, C., Vater, A. & Schröder-Abé, M. (2021). Self-Compassion and Coping: a Meta-Analysis. *Mindfulness, 12*. [10.1007/s12671-020-01563-8](https://doi.org/10.1007/s12671-020-01563-8).
- Farber, J.M., Weinerman, B.H., Kuypers, J.A. (1984) Psychosocial distress in oncology outpatients. *Journal of Psychosocial Oncology 2*, 109–118 [http://doi:10.1300/J077v02n03\\_09](http://doi:10.1300/J077v02n03_09)
- Ferrari, M., Hunt, C., Harrysunker, A., Abbott, M. J., Beath, A. P., & Einstein, D. A. (2019). Self-Compassion Interventions and Psychosocial Outcomes: A Meta-Analysis of RCTs. *Mindfulness, 10*(8), 1455–1473. <https://doi.org/10.1007/s12671-019-01134-6>
- Finlay-Jones, A., Xie, Q., Huang, X., Ma, X., & Guo, X. (2017). A pilot study of the 8-week Mindful Self-Compassion training program in a Chinese community sample. *Mindfulness, 9*(3), 993–1002.
- Friis, A. M., Johnson, M. H., Cutfield, R. G., & Consedine, N. S. (2015). Does kindness matter? Self-compassion buffers the negative impact of diabetes-distress on HbA1c. *Diabetic Medicine, 32*(12), 1634–1640. <http://doi:10.1111/dme.12774>
- Friis, A. M., Johnson, M. H., Cutfield, R. G., & Consedine, N. S. (2016). Kindness matters: a randomized controlled trial of a Mindful Self- Compassion intervention improves depression, distress, and HbA1c among patients with diabetes. *Diabetes Care, 39*(11), 1963–1971.

- Glaus, A., Crow, R., & Hammond, S. (1996). A qualitative study to explore the concept of fatigue/tiredness in cancer patients and in healthy individuals. *Supportive Care in Cancer*, *4*(2), 82-96.
- Hamaker, E., Nesselroade, J., & Molenaar, P. (2007). The integrated trait–state model. *Journal of Research in Personality*, *41*, 295-315. 10.1016/j.jrp.2006.04.003.
- Heinze, J. E., Kruger, D. J., Reischl, T. M., Cupal, S., & Zimmerman, M. A. (2015). Relationships among disease, social support, and perceived health: A lifespan approach. *American Journal of Community Psychology*, *56*(3-4), 268–279. <http://doi:10.1007/s10464-015-9758-3>
- Hektner, J. M., Schmidt, J. A., & Csikszentmihalyi, M. (2007). Experience sampling method: Measuring the quality of everyday life. Thousand Oaks, CA: Sage. <http://doi:10.4135/9781412984201>
- Hofmann, S. G., Grossman, P., & Hinton, D. E. (2012). Loving-kindness and compassion meditation: Potential for psychological interventions. *Clinical Psychology Review*, *31*(7), 1126-1132. <http://doi:10.1016/j.cpr.2011.07.003>. Loving-Kindness.
- Homan, K. J., & Sirois, F. M. (2017). Self-compassion and physical health: Exploring the roles of perceived stress and health-promoting behaviors. *Health Psychology Open*, *4*(2), 205510291772954. <http://doi:10.1177/2055102917729542>
- Hormuth, S. E. (1986). The sampling of experiences in situ.. *Journal of Personality*, *54*(1), 262–293. <https://doi.org/10.1111/j.1467-6494.1986.tb00395.x> Integraal Kankercentrum Nederland (2022, May 31). Incidentie kanker totaal. Retrieved from: <https://iknl.nl/en/ncr/ncr-data-figures>
- Johnson, E. A., & O'Brien, K. A. (2013). Self-compassion soothes the savage ego-threat system: Effects on negative affect, shame, rumination, and depressive symptoms. *Journal of Social and Clinical Psychology*, *32*(9), 939-963.
- Katon, W., & Ciechanowski, P. (2002). Impact of major depression on chronic medical illness. *Journal of Psychosomatic Research*, *53*(4), 859–863. [http://doi:10.1016/S0022-3999\(02\)00313-6](http://doi:10.1016/S0022-3999(02)00313-6)
- Kelly, A., Katan, A., Sosa Hernandez, L., Nightingale, B, Geller, J. (2021) Why would I want to be more self-compassionate? A qualitative study of the pros and cons to cultivating self-compassion in individuals with anorexia nervosa. *Br J Clin Psychol*. *60*(1), 99-115. <http://doi:10.1111/bjc.12275>.
- Kwakkenbos, L., Willems, L. M., van den Hoogen, F. H., van Lankveld, W. G., Beenackers,



- KWF. (2018). Gevolgen van kanker. Retrieved from <https://www.kwf.nl/kanker/gevolgen-van-kanker>
- Lopez, A., Sanderman, R., Smink, A., Zhang, Y., Sonderen, E., van, Ranchor, A., & Chroevvers, M. J. (2015). A reconsideration of the Self-Compassion Scale's total score: Self-compassion versus self-criticism. *PLOS One*, 10(7), e0132940. <http://doi:10.1371/journal.pone0132940>
- Love, A. W., Kissane, D. W., Bloch, S., & Clarke, D. M. (2002). Diagnostic efficiency of the Hospital Anxiety and Depression Scale in women with early stage breast cancer. *Australian & New Zealand Journal of Psychiatry*, 36(2), 246-250. <http://doi:10.1046/j.1440-1614.2002.01014.x>
- MacBeth, A., & Gumley, A. (2012). Exploring compassion: A meta-analysis of the association between self-compassion and psychopathology. *Clinical Psychology Review*, 32, 545-552. <http://doi:10.1016/j.cpr.2012.06.003>.
- Manfredi, C., Caselli, G., Pescini, F., Rossi, M., Rebecchi, D., Ruggiero, G., Sassaroli, S. (2016). Parental criticism, self-criticism, and their relation to depressive mood: An exploratory study among a non-clinical population. *Research in Psychotherapy: Psychopathology, Process and Outcome*, 19. <http://doi:10.4081/ripppo.2016.178>.
- Marshall, S. L., Parker, P. D., Ciarrochi, J., Sahdra, B., Jackson, C. J., & Heaven, P. C. (2015). Self-compassion protects against the negative effects of low self-esteem: A longitudinal study in a large adolescent sample. *Personality and Individual Differences*, 74, 116-121. <https://doi.org/doi:10.1016/j.paid.2014.09.013>.
- Morris, D.W., Trivedi, M.H., Fava, M., Wisniewski, S.R., Balasubramani, G.K., Khan, A.Y., Jain & S., Rush, A.J. (2009) Diurnal mood variation in outpatients with major depressive disorder. *Depress Anxiety*, 26(9), 851-63. <http://doi:10.1002/da.20557>.
- Muris, P., Meesters, C., Pierik, A., & de Kock, B. (2016). Good for the self: Self-compassion and other self-related constructs in relation to symptoms of anxiety and depression in non-clinical youths. *Journal of Child and Family Studies*, 25(2), 607–617.
- Musthag, 2011. "Exploring Micro-Incentive Strategies for Participant Compensation in High-Burden Studies."
- Myin-Germeys I., Kasanova Z., Vaessen T., Vachon H., Kirtley O., Viechtbauer W., Reininghaus U. (2018). Experience sampling methodology in mental health research: new insights and technical developments. *World Psychiatry* 17(2), S. 123-132. <https://doi.org/10.1002/wps.20513.van>.

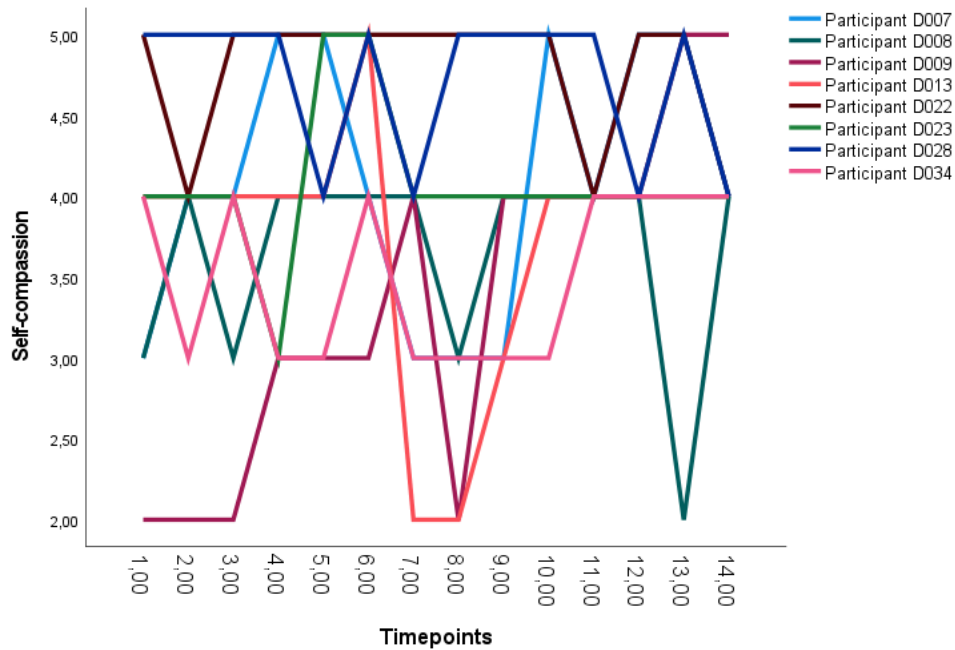
- Myin-Germeys, I. & Kuppens P. (2021). *Open Handbook of Experience Sampling Methodology*. <https://doi.org/979-8615971259>.
- Neff, K. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity* 85–102. <http://doi:10.1080/15298860390129863>
- Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self and Identity*, 2, 223-250. <http://doi:10-1080/15298860390209035>.
- Neff, K. D., Hsieh, Y.-P., & Dejitterat, K. (2005). Self-compassion, Achievement Goals, and Coping with Academic Failure. *Self and Identity*, 4(3), 263–287. <https://doi.org/10.1080/13576500444000317>
- Neff, K.D., Kirkpatrick, K.L., and Rude, S.S. (2007) Self-compassion and adaptive psychological functioning. *Journal of Research in Personality*, 41, 139-154.
- Neff, K. D., & Germer, C. K. (2013). A pilot study and randomized controlled trial of the mindful self-compassion program. *Journal of clinical psychology*, 69 (1), 28–44. <http://doi:10.1002/jclp.21923>.
- Neff, K. D., Tóth-Király, I., Knox, M. C., Kuchar, A., & Davidson, O. (2021). The Development and Validation of the State Self-Compassion Scale (Long- and Short Form). *Mindfulness*, 12(1), 121–140. <https://doi.org/10.1007/s12671-020-01505-4>
- Nery-Hurwit, M., Yun, J., & Ebbeck, V. (2018). Examining the roles of self-compassion and resilience on health-related quality of life for individuals with Multiple Sclerosis. *Disability and Health Journal*, 11(2), 256–261. <http://doi:10.1016/j.dhjo.2017.10.010>
- Patten, S. B. (2001). Long-term medical conditions and major depression in a Canadian Population study at waves 1 and 2. *Journal of Affective Disorders*, 63(1-3), 35–41. [http://doi:10.1016/S0165-0327\(00\)00186-5](http://doi:10.1016/S0165-0327(00)00186-5)
- Pinto-Gouveia, J., Duarte, C., Matos, M., & Fráguas, S. (2014). The protective role of self-compassion in relation to psychopathology symptoms and quality of life in chronic and in cancer patients. *Clinical Psychology & Psychotherapy*, 21, 311–323. <http://doi:10.1002/cpp.1838>
- Runyan, J. D., Fry, B. N., Steenbergh, T. A., Arbuckle, N. L., Dunbar, K., & Devers, E. E. (2019). Using experience sampling to examine links between compassion, eudaimonia, and pro-social behavior. *Journal of personality*, 87(3), 690-701.
- Sedighimornani, N., Rimes, K. A., & Verplanken, B. (2019). Exploring the relationships between mindfulness, self-compassion, and shame. *SAGE Open*, 9(3), 215824401986629. <http://doi:10.1177/2158244019866294>

- Sirois, F. M., Molnar, D. S., & Hirsch, J. K. (2015). Self-compassion, stress, and coping in the context of chronic illness. *Self and Identity*, 14(3), 334–347. <http://doi:10.1080/15298868.2014.99>
- Sirois, F. M., & Hirsch, J. K. (2019). Self-compassion and adherence in five medical samples: The role of stress. *Mindfulness*, 10(1), 46–54. <http://doi:10.1007/s12671-018-0945-9>
- Stark, L., Tofthagen, C., Visovsky, C., & McMillan, S. C. (2012). The symptom experience of patients with cancer. *Journal of hospice and palliative nursing: JHPN: the official journal of the Hospice and Palliative Nurses Association*, 14(1), 61.
- Stefanek M, Derogatis L, Shaw A (1987) Psychological distress among oncology patients. *Psychosomatics* 28, 530–538
- Trompetter, H. R., de Kleine, E., & Bohlmeijer, E. T. (2017). Why does positive mental health buffer against psychopathology? An exploratory study on self-compassion as a resilience mechanism and adaptive emotion regulation strategy. *Cognitive Therapy and Research*, 41(3), 459–468. <http://doi:10.1007/s10608-016-9774-0>
- Verhagen, S. J., Hasmi, L., Drukker, M., van Os, J., Delespaul, P. A. (2016) Use of the experience sampling method in the context of clinical trials. *Evid Based Ment Health*, 19(3), 86-9. <http://doi:10.1136/ebmental-2016-102418>
- Vlierberghe, M.K. van. 2019. *Self-critique and self-compassion among cancer patients: a qualitative study*. [Unpublished master thesis], University of Twente
- Zabora JR, Blanchard, C.G., Smith, E.D., et al (1997) Prevalence of psychological distress among cancer patients across the disease continuum. *Journal of Psychosocial Oncology* 15, 73–86. [http://doi:10.1300/J077v15n02\\_05](http://doi:10.1300/J077v15n02_05)
- Zhu, L., Wang, J., Liu, S., Xie, H., Hu, Y., Yao, J., ... & Fler, J. (2020). Self-Compassion and Symptoms of Depression and Anxiety in Chinese Cancer Patients: The Mediating Role of Illness Perceptions. *Mindfulness*, 11(10), 2386-2396.
- Zuroff, D. C., Igeja, I., & Mongrain, M. (1990). Dysfunctional attitudes, dependency, and self-criticism as predictors of depressive mood states: A 12-month longitudinal study. *Cognitive Therapy and Research*, 14, 315–326. <https://doi.org/10.1007/BF01183999>

## Appendix

**Figure 5.**

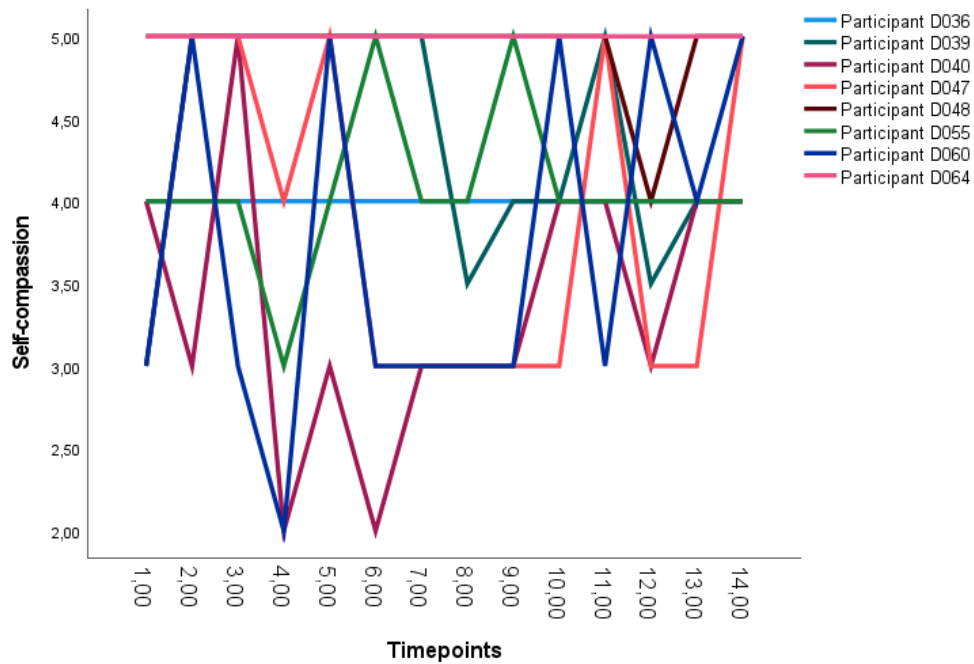
Individual longitudinal fluctuations



N = 34

**Figure 6.**

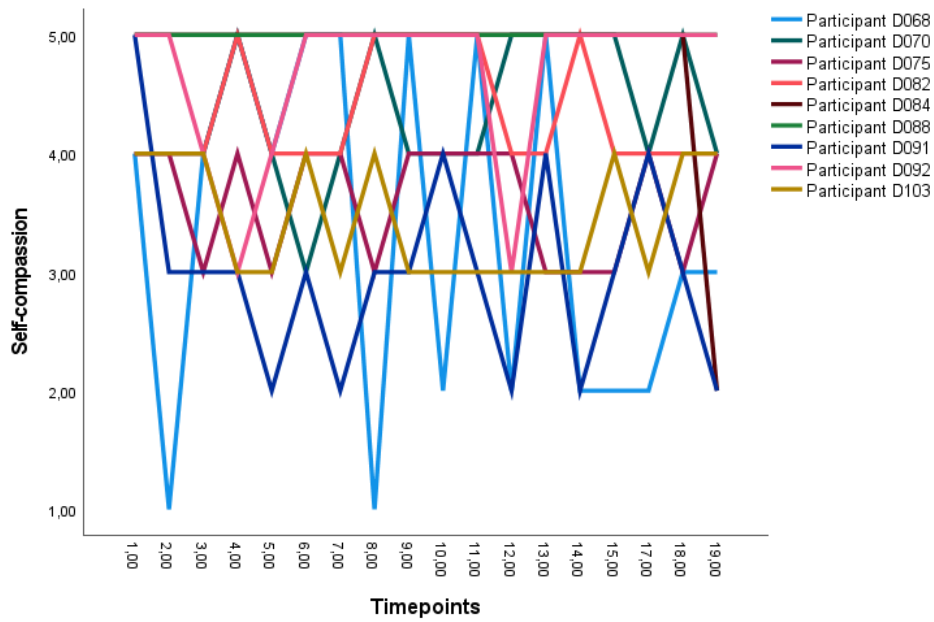
Individual longitudinal fluctuations



N = 34

**Figure 7.**

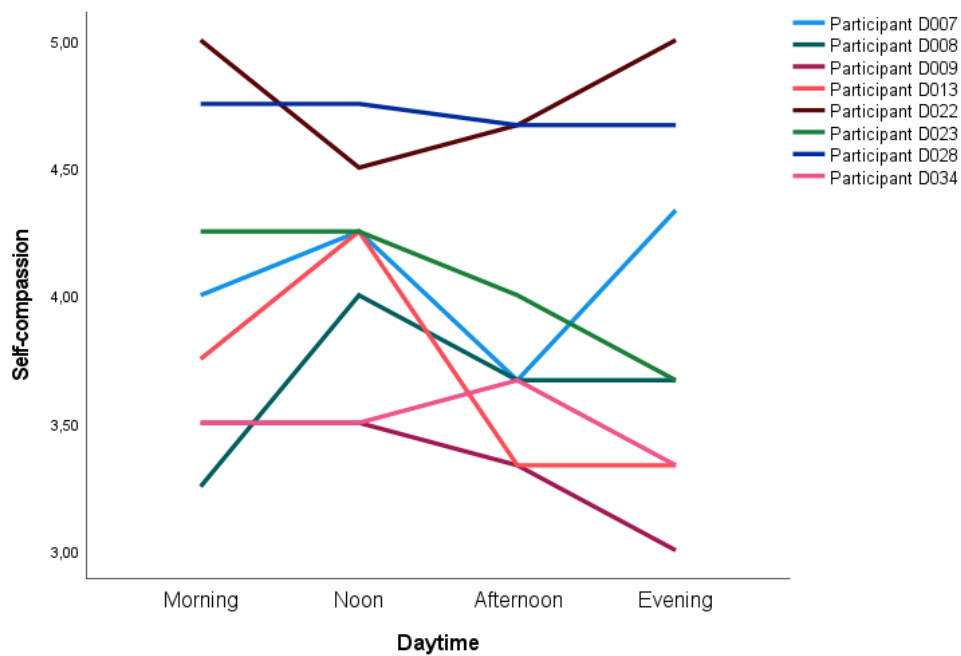
### Individual longitudinal fluctuations



N = 34

**Figure 8.**

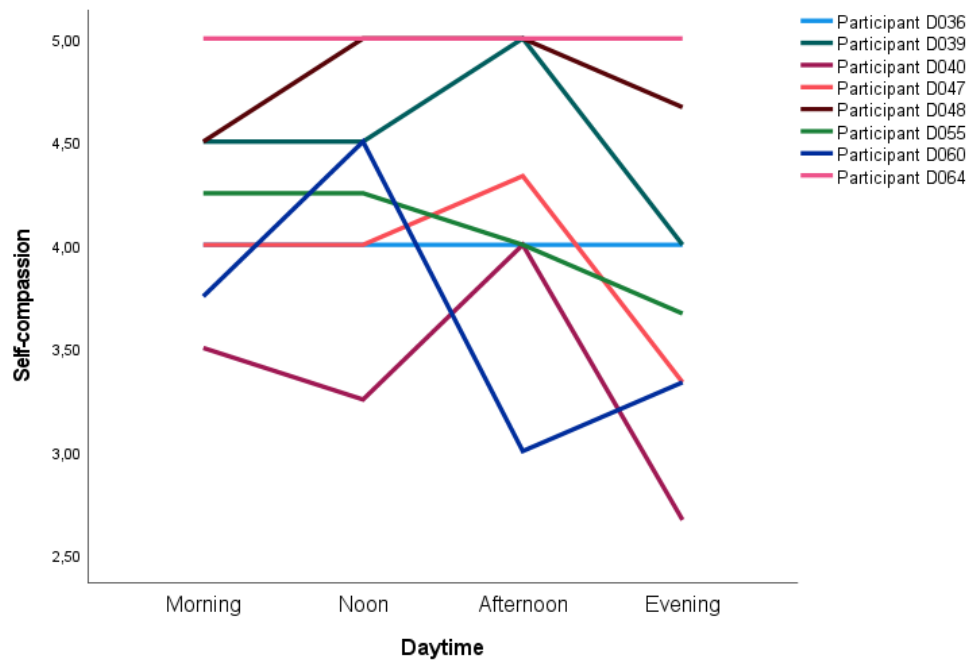
### Individual diurnal fluctuations



N = 34

**Figure 9.**

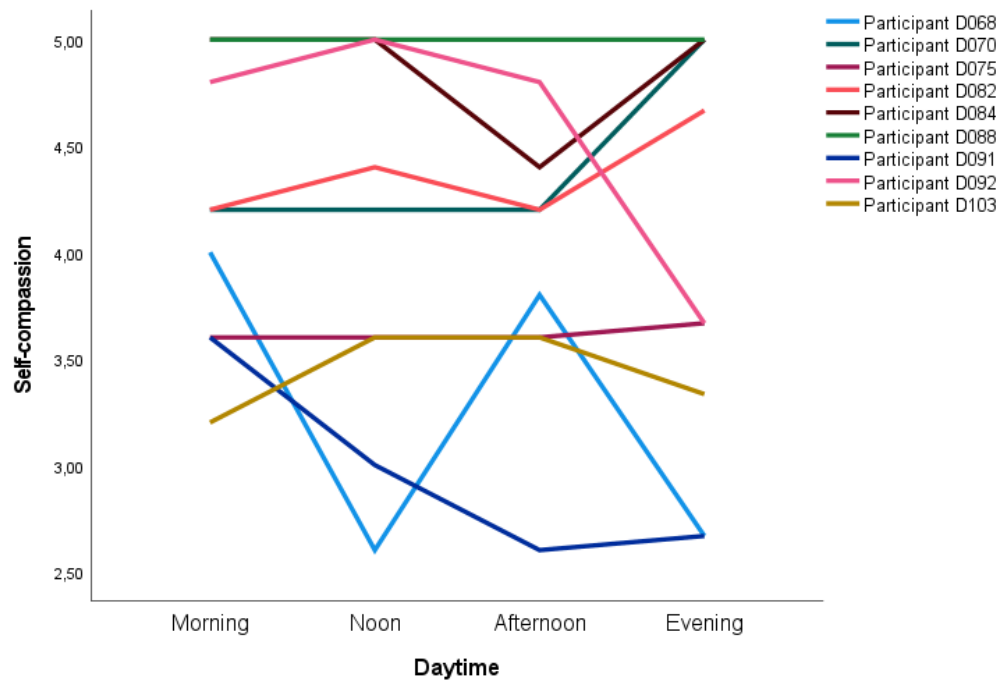
### Individual diurnal fluctuations



N = 34

**Figure 10.**

### Individual diurnal fluctuations



N = 34