A daily diary study of the relationships among daily self-compassion, perceived stress and health-promoting behaviours

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Previous studies consistently found that trait self-compassion is positively associated with health-promoting behaviours, and perceived stress mediates the relationship. The current study primarily aimed at examining whether state self-compassion varying from day to day (daily self-compassion) played the same role as trait self-compassion in improving health-promoting behaviours and whether or not perceived stress would be the mediator in this relationship. Eighty-nine Chinese employees were recruited to finish demographic information and the trait measure of self-compassion first, and then finish daily diaries for seven consecutive days. Daily diary measures included daily self-compassion, perceived stress and health-promoting behaviours including both eating behaviours and exercise behaviours. The results of 1-1-1 multilevel mediation analyses showed that, at both the within- and between-person level, daily self-compassion could positively predict daily eating behaviour through the reduction of perceived stress. However, daily self-compassion did not influence exercise behaviour at both levels. The results of 2-1-1 multilevel mediation analyses cross-validated the between-person relationships in the 1-1-1 multilevel mediation models. These results suggest that, both short-term interventions aiming at increasing state self-compassion and long-term interventions aiming at increasing trait self-compassion can benefit one’s eating behaviours through the reduction of stress.

Keywords: Self-compassion; Perceived stress; Health-promoting behaviours; A daily diary study; Mediation.

According to the World Health Organization (WHO, 2018a), the rate of lifestyle-based diseases, such as obesity and diabetes, is rising on a global scale. Poor eating habits (Schulze & Hu, 2002) and physical inactivity (Lee et al., 2012) have been found to be implicated in the development of lifestyle-based diseases. These diseases could be avoided or warded off if people take the initiative to conduct more health-promoting behaviours, such as exercising regularly or eating healthily. Unfortunately, nowadays physically inactive lifestyles are highly prevalent (WHO, 2018a), and people have more maladaptive eating behaviours such as consuming excessive amounts of foods high in sugar, fats, and salts/sodium, as well as deficient amounts of foods with vitamins, minerals and dietary fibres like fruits, vegetables and whole grains (WHO, 2018b). Therefore, understanding the factors and processes that promote or interfere with health-promoting behaviours is of great importance.

Self-compassion was recently found to be beneficial toward health-promoting behaviours (Dunne, Sheffield, & Chilcot, 2016; Homan & Sirois, 2017; Sirois, Kittner, & Hirsch, 2015). Derived from Buddhist traditions, self-compassion is defined as a kind, compassionate, and acceptant attitude toward oneself when confronting failure or frustration (Neff, 2003b). According to Neff (2003b), self-compassion involves three interrelated components: (a) self-kindness: treating oneself with care and understanding rather than harsh judgement and self-criticism; (b) common humanity: seeing one’s own experiences as part of a larger human experience and...
recognising that life is imperfect; and (c) mindfulness: holding one’s painful thoughts and feelings in balanced awareness rather than over-identifying with them.

A great amount of research has demonstrated that self-compassion is beneficial for psychological health (for a review, see Zessin, Dickhäuser, & Garbade, 2015). For example, self-compassion is found to be negatively linked to perceived stress (Allen & Leary, 2010; Homan & Sirois, 2017), anxiety and depression (Raes, 2010). More importantly, interventions aimed at increasing self-compassion could lead to the reduction of stress, anxiety, depression and burnout (for a review, see Wilson, Mackintosh, Power, & Chan, 2019).

Researchers have recently been paying more attention to the positive influences of self-compassion on physical health. In patients infected with human immunodeficiency virus, self-compassion was related to more adaptive reactions to the illness (Brion, Leary, & Drabkin, 2014). In college student samples, self-compassion took on a protective role against stress-related poor sleep (Hu, Wang, Sun, Artega-Garcia, & Purol, 2018). A meta-analysis from 15 students and community samples showed that self-compassion was positively correlated with health-promoting behaviours, including eating habits, exercise, sleep behaviours and stress management (Sirois et al., 2015).

Self-regulation theory was proposed to explain the mechanism of the positive effect of self-compassion on health-related outcomes (Baumeister & Heatherton, 1996; Terry & Leary, 2011). Given sufficient practical conditions, such as time and resources, people may still need self-regulation abilities to engage in health-promoting behaviours. Meanwhile, regulating negative emotion (e.g., perceived stress) could drain one’s self-regulation resources. People who are high in self-compassion tend to experience negative events in a more mindful and self-supportive way (Neff, 2003a) and thus experience fewer negative emotions which would reduce their self-regulation resources. As a result, they have more resources available for other self-regulation tasks, such as adhering to their health goals and conducting health-promoting behaviours (Terry & Leary, 2011).

Empirical evidences have also supported the beneficial effects of self-compassion on health-promoting behaviours by reducing stress. There is evidence of consistent relationships between self-compassion and perceived stress (Allen & Leary, 2010; Homan & Sirois, 2017), as well as perceived stress and health behaviours (Homan & Sirois, 2017; Ng & Jeffery, 2003). More importantly, there has been one cross-sectional study which examined this pathway and supported the mediation role of perceived stress (Homan & Sirois, 2017).

To date, previous studies have mainly focused on the between-person effects of self-compassion (e.g., Homan & Sirois, 2017; Sirois et al., 2015), as self-compassion has usually been viewed as a trait variable (Neff, 2003a, 2003b). That is, a person with either higher or lower levels of self-compassion would conduct either more or less health-promoting behaviours. However, recent studies have found that about one-third of the variance of self-compassion occurred within participants (Breines, Toole, Tu, & Chen, 2014; Kelly & Stephen, 2016), which indicates that the level of self-compassion within an individual could fluctuate over time. This opens the possibility to explore the within-person relationships among self-compassion, perceived stress and health-promoting behaviours. It is worth investigating whether or not a single individual who is more self-compassionate on a given day than usual will be less likely to perceive stress and more likely to conduct health-promoting behaviours. Thus, examining the within-person relationships provide more information for practical implications compared to between-person relationships.

To the best of our knowledge, only two studies have examined the within-person effects of self-compassion, both were on eating behaviours (Breines et al., 2014; Kelly & Stephen, 2016). Both studies were daily diary studies which lasted for 4 and 7 days, respectively. The results from these studies showed that on days when female undergraduates were more self-compassionate toward themselves, they reported less disordered eating and more intuitive eating. These studies preliminarily suggested that the benefits of self-compassion could not only come from being a self-compassionate person, but also from treating oneself more compassionately on a given day. However, generalisation of these findings was restricted to female samples and eating behaviours. More studies are needed to examine the within-person effects of self-compassion with varied samples and on other health-promoting behaviours.

One of the primary goals of the current study was to further explore the within-person effects of self-compassion on health-promoting behaviours. Instead of treating health-promoting behaviours as a general variable (Homan & Sirois, 2017), two kinds of health-promoting behaviours were examined in this study, eating behaviour and exercise behaviour, allowing us to explore the effects of self-compassion on specific health-promoting behaviours. Eating behaviour has been directly and consistently found to be associated with self-compassion at both the between- and within-person level (e.g., Breines et al., 2014; Kelly & Stephen, 2016). However, exercise behaviour was always treated as a component of health-promoting behaviours in previous studies; no research directly examined its relationship with self-compassion (Homan & Sirois, 2017; Sirois et al., 2015). This leaves the specific effect of self-compassion on exercise behaviour unclear. The current study will explore the effect of self-compassion on both eating and exercise behaviours.
The second primary goal of the current study was to examine whether perceived stress was the potential mediator through which self-compassion could have an impact on health-promoting behaviours. Although its mediation role has been examined at the between-person level (Homan & Sirois, 2017), the current study will further examine it at the within-person level. To examine the within-person relationship among self-compassion, perceived stress and health-promoting behaviours, a daily diary method was used in this study. Data on daily measures of self-compassion, perceived stress as well as eating and exercise behaviour were collected to examine the within-person relationships. Additionally, trait self-compassion was also collected, which was used to repeatedly validate the between-person relationships among these variables.

METHODS

Participants

In total, 89 Chinese participants were recruited. One did not complete the baseline measurement and six dropped out during the 1-week diary period. Thus, they were excluded from all the analyses, which resulted in 82 participants being included in the final data analysis. No differences were found in all the baseline measures between those who were excluded and those who were included in the study (all ps > .05).

The average age of the final sample was 35.18 (SD = 5.802). Among them, 63.4% were identified as women, and 87.8% were married, 9.8% were single, and 2.4% were divorced. In addition, of the 82 final participant sample, 57.3% had graduated with a bachelor degree, 25.6% with a master degree, 2.4% with a doctor degree, and 14.6% did not receive a bachelor degree.

Procedure

The Human Subject Review Boards of the Department of Psychology of Sun Yat-sen University granted approval to the study. Using the method of snowball sampling via social-networking, participants were recruited from different organisations in China, such as internet companies and schools. All participants were required to be currently employed. Questionnaires were distributed through a data collection website (sojump). Participants were first asked to complete a single survey questionnaire and then complete daily diary questionnaires for a week. The survey questionnaire consisted of an introduction of the study, the inclusion criteria, the informed consent form, and the measure of trait self-compassion as well as demographic questions. Only those who signed in the informed consent form would complete the following questions. Later, participants completed one diary questionnaire in the evening before going to bed for a week (from Monday to Sunday). The daily diary questionnaire was identical each day, including measures of daily self-compassion, perceived stress, exercise behaviour and eating behaviour. The data included a total of 561 daily records (13 missing daily records, 6.8 records per person on average).

Measures

Data collection consisted of a general survey questionnaire and daily diary questionnaires. The general survey completed before daily measures included demographic information (age, gender, marriage, education, etc.) and the measure of trait self-compassion. All other variables were assessed on a daily basis. For variables assessed at a daily level, Cronbach alpha was calculated individually for every day, and then the average of the respective seven reliabilities was taken.

Trait self-compassion

Trait self-compassion was assessed with the 26-item Self-Compassion Scale (SCS; Neff, 2003a). The SCS assesses the three main components of self-compassion and their negative counterparts. That is, self-kindness (self-judgement), common humanity (isolation), and mindfulness (over-identification). All items are prefaced with the statement “how I typically act toward myself during difficult times” and respondents indicate how often they behave in the described way using response options ranging from 1 (Almost Never) to 5 (Almost Always). Total scores across the 26 items defined each participant’s level of self-compassion. The potential range of the total SCS is 26–130. In the current study, the Cronbach alpha was .911.

Daily self-compassion

Based on a preliminary study, the items with the highest factor loading from each subscale of the 26-item SCS were chosen to form the Daily Self-compassion Scale (DSCS). This resulted in six final items, that is, “When I’m going through a very hard time, I give myself the caring and tenderness I need.” “When I see aspects of myself that I don’t like, I get down on myself.” “I try to see my failings as part of the human condition.” “When I’m feeling down, I tend to feel like most other people are probably happier than I am.” “When something painful happens, I try to take a balanced view of the situation.” “When something upsets me, I get carried away with my feelings.” The preface instructions were altered to “how I acted towards myself during difficult times today” using a scale from 1 (almost never) to 5 (almost always). The potential range of the total DSCS is 6 to 30. The Cronbach alpha was .725.
**Perceived stress**

Perceived stress was measured using the Short Form Perceived Stress Scale (PSS-4), which describes life stress in terms of how much one felt that things were not in control (Leung, Lam, & Chan, 2010). Participants answered the questions based on their experience “today” and response options ranged from 0 (Never) to 4 (Very Often). The potential range of PSS-4 is 0–16. The Cronbach alpha was .722.

**Exercise behaviour**

Exercise behaviour and eating behaviour were assessed as health-promoting behaviours. Exercise behaviour was measured with the adapted version of the Godin Leisure-Time Exercise Questionnaire (LTEQ; Godin & Shephard, 1997). Participants reported their exercise behaviour over the past 24 hours through three items. Participants reported the duration of time (in minutes) they participated in strenuous (> 100 beats per minute), moderate (not exhausting), and mild (little exertion) exercise activities or sports. Strenuous (e.g., running, basketball, vigorous swimming; weighted 1.0) and moderate (e.g., fast walking, easy bicycling, easy swimming; weighted 0.5) exercises were combined to form one measure of physical activity because conceptually they represent a greater effort compared to mild (e.g., easy walking, fishing; weighed 0.0) exercise (Novak & Webster, 2011). WM_EB = 1 × M_s + 0.5 × M_m (WM_EB: weighted minutes of exercise behaviour; M_s: minutes of strenuous exercise; M_m: minutes of moderate exercise).

Exercise behaviour was Box-cox transformed because the original metrics were skewed and included lots of zeros (zero meant not spending any time exercising). The two-parameter version of the box-cox transformation equation is

\[
y(\lambda_1, \lambda_2) = \begin{cases} 
\frac{(y + \lambda_2)^{\lambda_1} - 1}{\lambda_1} & \text{when } \lambda_1 \neq 0 \\
\log(y + \lambda_2) & \text{when } \lambda_1 = 0
\end{cases}
\]

We set \( \lambda_1 = 0 \) and \( \lambda_2 = 1 \) because it has the neat property of mapping zero to zero (Box & Cox, 1964). Therefore, the final score of exercise behaviour was continuous, and its theoretical range was from zero to infinity.

**Eating behaviour**

Eating behaviour was measured with a 3-item scale. According to the Chinese Dietary Guidelines (Chinese Nutrition Society, 2016), it is important to practice a balanced and varied diet (e.g., low in fat, oil, and cholesterol), eat on time, and consume an appropriate amount of food for each meal (30% for breakfast, 40% for lunch and 30% for dinner). Therefore, this scale asked participants to report to what degree did they report on time for each meal, choose healthy food (e.g., low in fat, oil and cholesterol) and consume an appropriate amount of food based on their experiences “today.” The preface instructions asked participants to report the extent they followed these guidelines and response options ranged from 0 (not at all) to 4 (to a great extent). Total scores across the three items defined each participant’s eating behaviour. The potential range of eating behaviour is 0–12. The Cronbach alpha was .749.

**Data analyses**

Given the hierarchical data structure, multilevel Structural equation modelling (MSEM) was used to test the hypotheses, following Preacher and colleagues’ recommendations for testing multilevel mediation models (Preacher, Zhang, & Zyphur, 2011). With the 1-1-1 design, MSEM could decompose the variance of Level 1 variables (day level) into within- and between-person components and thereby account for the fact that relationships might differ between the within- and between-person levels. Consequently, using daily self-compassion (DSC), analyses could reveal information on (a) the effect of daily variations from a person’s mean level of self-compassion on outcome variables (within-person; state component); (b) the effect of a person’s mean level of self-compassion on outcome variables (between-person; trait component); and (c) the extent to which this relationship is mediated by perceived stress on the within- and the between-person levels, respectively (see Figure 1a). To replicate findings regarding between-person effects of self-compassion from the 1-1-1 model, the effect of trait self-compassion was tested through the 2-1-1 mediation model, with trait self-compassion (TSC) as a Level 2 (person level) predictor and perceived stress and the outcome variables assessed at Level 1 (see Figure 1b).

Due to the potential nonnormality of the underlying distributions for the indirect effects, 95% Monte Carlo confidence intervals (MCCIs) were used to assess their significance (Preacher & Selig, 2012). The Monte Carlo method for assessing Mediation was proposed as the most appropriate method in the multilevel context (Preacher & Selig, 2012). If the MCCI does not contain the value of zero, the indirect effect will be considered significant.

**Compliance with Ethical Standards** All procedures performed in the current study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

**Informed Consent:** Informed consent was obtained from all participants included in the study.
SELF-COMPASSION AND HEALTH BEHAVIOURS

Figure 1. Multilevel structural equation model showing a 1-1-1 and 2-1-1 multilevel mediation model between daily self-compassion (DSC)/trait self-compassion (TSC), perceived stress (PS), and an outcome variable (O; i.e. exercise behaviour or eating behaviour). $c'_w, c'_b =$ direct effect; $c_w, c_b =$ total effect; figure is based on Preacher et al. (2011).

Table 1
The mean and SD for all study variables for each of the 7 days

<table>
<thead>
<tr>
<th></th>
<th>Day 1 M(SD)</th>
<th>Day 2 M(SD)</th>
<th>Day 3 M(SD)</th>
<th>Day 4 M(SD)</th>
<th>Day 5 M(SD)</th>
<th>Day 6 M(SD)</th>
<th>Day 7 M(SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily SC</td>
<td>19.62 (2.08)</td>
<td>19.69 (2.16)</td>
<td>19.56 (2.31)</td>
<td>19.55 (2.14)</td>
<td>19.46 (3.23)</td>
<td>19.39 (2.38)</td>
<td>19.51 (2.26)</td>
</tr>
<tr>
<td>Perceived stress</td>
<td>6.23 (2.33)</td>
<td>6.28 (2.27)</td>
<td>6.27 (1.96)</td>
<td>6.29 (2.27)</td>
<td>6.41 (2.36)</td>
<td>6.03 (2.58)</td>
<td>5.87 (2.54)</td>
</tr>
<tr>
<td>Exercise behaviour</td>
<td>.96 (1.49)</td>
<td>.78 (1.29)</td>
<td>.88 (1.42)</td>
<td>.83 (1.47)</td>
<td>.86 (1.44)</td>
<td>.98 (1.60)</td>
<td>.81 (1.43)</td>
</tr>
<tr>
<td>Eating behaviour</td>
<td>8.48 (1.95)</td>
<td>8.41 (1.89)</td>
<td>8.12 (2.09)</td>
<td>8.08 (2.01)</td>
<td>7.73 (2.18)</td>
<td>7.96 (2.34)</td>
<td>8.21 (2.07)</td>
</tr>
</tbody>
</table>

Note. SC = self-compassion, M = mean, SD = standard deviation.

RESULTS

Preliminary analyses

No gender differences existed among all study variables ($ps > .05$). Age was not correlated with the dependent variables (eating and exercise behaviour). Therefore, gender and age were not controlled in the following analyses. To rule out time as a source of confounding of within-person relationships, we included time as a control variable in the multilevel analysis (Bolger & Laurenceau, 2013).

The mean and SD for all study variables for each of the 7 days are presented in Table 1. The relative amount of variance in study variables lying between- and within-person were examined by inspecting the intra-class coefficient (ICC) based on an unconditional random coefficient model (Bolger & Laurenceau, 2013). As shown in Table 2, daily self-compassion displayed an ICC of .765, indicating that 76.5% of the variance in self-compassion was a between-person variation, while 23.5% lay within-persons. This suggested that self-compassion could indeed be conceptualised as a trait and a state construct and that it was appropriate to use multilevel modelling. ICCs of other variables ranged from .403 (eating behaviour) to .489 (perceived stress), indicating that more than half of their variance was at the within-person level and there was sufficient within- and between-person variation in the data hierarchy to estimate a multi-level model.

As depicted in Table 2, both at the within- and between-person level, the correlations between self-compassion, perceived stress and eating behaviour were significant, only daily self-compassion was marginally significantly correlated to eating behaviour at the within-person level ($p = .055$). However, exercise behaviour was not correlated to all other variables at both levels.

Multilevel mediation analysis

The effect of daily self-compassion

The 1-1-1 model was tested to examine the mediation role of perceived stress between daily self-compassion and health-promoting behaviour at the between- and within-person levels. Since daily exercise was not associated with daily self-compassion and perceived stress at both levels, only eating behaviour was included in further analysis. As shown in Figure 2, daily self-compassion could have a positive indirect effect on eating behaviour through decreasing perceived stress both at the within- and between-person level, while the direct effect of daily self-compassion on eating behaviour were not
The last decade has witnessed an explosion of research on self-compassion and its association with psychological and physical health (e.g., Siros et al., 2015; Zessin et al., 2015). Based on the consistent findings of the between-person relationships among self-compassion, perceived stress and health-promoting behaviours, the current study further examined their relationships at the within-person level. Although exercise behaviour was not associated with daily self-compassion, the results from this study revealed that on days when individuals treated themselves more self-compassionately than what’s typical for them, they experienced less perceived stress, and in turn, adopted healthier eating behaviours.

Theoretically, self-compassion is proposed to be beneficial for health-promoting behaviour by maintaining self-regulation resources which are easily reduced by negative emotions such as depression, anxiety and stress (Terry & Leary, 2011). The current study provided support to this theoretical model. Self-compassion was found to be positively related to healthy eating behaviour through reducing one’s perceived stress. Moreover, this pathway was replicated both at the daily level and trait level of self-compassion. These findings added empirical evidence to the beneficial role of self-compassion on health-promoting behaviour (Homan & Siros, 2017; Siros et al., 2015).

Self-compassion has been treated as an individual difference variable since Neff (2003a) proposed its conceptualization. Since then, research has repeatedly

### Table 2

Correlations between study variables and intra-class correlations

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>ICC</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>age</td>
<td>35.18</td>
<td>5.80</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>2</td>
<td>trait SC</td>
<td>84.84</td>
<td>12.83</td>
<td>.34**</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>.02</td>
<td>.29</td>
</tr>
<tr>
<td>3</td>
<td>Daily SC</td>
<td>19.57</td>
<td>5.05</td>
<td>.77</td>
<td>.34**</td>
<td>.82**</td>
<td>---</td>
<td>.43**</td>
<td>.02</td>
</tr>
<tr>
<td>4</td>
<td>Perceived stress</td>
<td>6.21</td>
<td>5.40</td>
<td>.49</td>
<td>-.34**</td>
<td>-.61**</td>
<td>-.61***</td>
<td>---</td>
<td>-.05</td>
</tr>
<tr>
<td>5</td>
<td>Exercise behaviour</td>
<td>0.87</td>
<td>1.45</td>
<td>.46</td>
<td>-.06</td>
<td>.06</td>
<td>-.02</td>
<td>.05</td>
<td>---</td>
</tr>
<tr>
<td>6</td>
<td>Eating behaviour</td>
<td>8.16</td>
<td>4.28</td>
<td>.40</td>
<td>.21</td>
<td>.25*</td>
<td>.23*</td>
<td>-.41***</td>
<td>-.07</td>
</tr>
</tbody>
</table>

Note. ***p < .001; **p < .01; *p < .05; Within-person correlations are above the diagonal and between-person correlations are below the diagonal. SC = self-compassion; ICC = intra-class correlation coefficient.

**The effect of trait self-compassion**

To examine the effect of trait self-compassion, the 2-1-1 model was tested. Daily exercise was not correlated to trait self-compassion, so it was not included in the mediation analysis. As shown in Figure 2, although trait self-compassion could not influence daily eating behaviour directly, it could promote eating behaviour through decreasing daily perceived stress. Analysis with Monte Carlo methods found a significant indirect effect of trait self-compassion on eating behaviour.

### DISCUSSION

The last decade has witnessed an explosion of research on self-compassion and its association with psychological and physical health (e.g., Siros et al., 2015; Zessin et al., 2015). Based on the consistent findings of the between-person relationships among self-compassion, perceived stress and health-promoting behaviours, the current study further examined their relationships at the within-person level. Although exercise behaviour was not associated with daily self-compassion, the results from this study revealed that on days when individuals treated themselves more self-compassionately than what’s typical for them, they experienced less perceived stress, and in turn, adopted healthier eating behaviours.
demonstrated that a given individual with a higher level of trait self-compassion can be much healthier both psychologically and physically (e.g., Sirois et al., 2015; Zessin et al., 2015). The current study and a few others firstly began to explore the within-person fluctuation of self-compassion and its effects on outcome variables (Breines et al., 2014; Kelly & Stephen, 2016). The results of the current study revealed that one-fourth of the variance of self-compassion was at the within-person level, which supported that the level of self-compassion in a given person does fluctuate over different days. This fluctuation of self-compassion was further found to be correlated with daily perceived stress and healthy eating. However, in the future studies, the factors that influence the fluctuation of self-compassion could be explored.

Inconsistent with expectation, the relationship between self-compassion and exercise was absent according to the results of the current study. In previous studies, exercise behaviour was mostly studied as a component of health-promoting behaviours (Dunne et al., 2016; Homan & Sirois, 2017; Sirois et al., 2015). To the best of our knowledge, there has been no study directly examining the relationship between self-compassion and exercise behaviour, while only one study found the positive association between self-compassion and motivation and attitude toward exercise in women (Magnus, Kowalski, & McHugh, 2010). The relationship between self-compassion and exercise behaviour remains understudied. When examining the data in the current study, it revealed that, compared to the mild exercise (333 in 561 records), participants reported less strenuous (60 in 561 records) and moderate (142 in 561 records) exercise, which resulted in a lot of zero in the data of exercise behaviour. Therefore, an additional analysis was conducted to further explore the relationships among daily self-compassion, perceived stress and mild exercise. The results showed that daily self-compassion could have a positive effect on mild exercise through decreasing perceived stress in the within-person level (please refer to the supplementary materials for detailed results). The reason for these results may be that, as employees, the opportunities to engage in moderate to strenuous exercise could be restricted by practical conditions, such as working load or family routine. However, on the days when they treated themselves with more compassion, they may feel less stressed and live a more exercise friendly lifestyle, through engaging in mild exercise behaviour such as walking more. Be that as it may, the current study is one of the few to directly examine the relationship between self-compassion and exercise behaviour. Further studies are needed to examine the relationships.

The current study theoretically implicated that the level of individual’s self-compassion could fluctuate in different days and the fluctuation was correlated with stress and healthy eating. Instead of conceptualising it as a stable trait, self-compassion has a state component, which is consistent with studies using experimental priming (e.g., Leary, Tate, Adams, Batts Allen, & Hancock, 2007). When self-compassion levels are higher, individuals tend to perceive less stress and eat healthier. However, the reason of the fluctuation of self-compassion on a daily basis still remains unexplored. It may be possible that fluctuations could be caused by the absence or different levels of daily challenges. It could be explored in future research.

Combining the findings from both within and between-person levels, it can be suggested that not only interventions which aim to increase the trait self-compassion of an individual, but also interventions which increase daily self-compassion (i.e., train an individual to be self-compassionate on a daily basis) can both reduce one’s perceived stress and improve one’s eating behaviour. Intervention programs which increase trait self-compassion have been developed and gained empirical evidence for their effectiveness (for a review, see Wilson et al., 2019). However, these programs require several weeks of training to steadily increase one’s ability for self-compassion. Perhaps some exercises in these programs may be suitable to be applied briefly and could then be used to increase an individual’s ability to be self-compassionate on a given day when needed. Future studies could examine the effectiveness of these exercises in improving daily self-compassion.

As a result of the daily diary method, we have extended our knowledge about the effect of self-compassion on health-promoting behaviour by examining them at the within-person level. Some limitations should still be noted. First, all daily variables were measured at the same time, therefore, the observed relationships among self-compassion, perceived stress and health-promoting behaviours cannot be interpreted as causal in nature. Future studies could set time lags between these measures or conduct an intervention study to examine the causal relationship. Second, like many other investigations of health behaviours, the current study relied heavily upon self-report measures which might introduce reporting biases. Future studies could include more objective indicators of eating behaviour and exercise behaviour, such as using electronic devices to record them. Third, the measure of daily self-compassion was based on our preliminary study with a similar sample. Future studies may need to validate the measure in their research. Fourth, the sample size was relatively small and the sampling method of snowballing could bring some biases. The generalisation of the findings should be limited to employee samples. Finally, only two health-promoting behaviours (eating behaviour and exercise behaviour) were examined. Other behaviours, such as sleep or alcohol use, are important to promote health as well. Future studies could investigate the relationship between self-compassion and these health-promoting behaviours.
CONCLUSIONS

The current study used a daily diary study to examine the within-person relationships between daily self-compassion, perceived stress and health-promoting behaviours. Results showed that on days when participants were more self-compassionate, they perceived less stress and adopted more health-promoting eating behaviours and that treating oneself more compassionately on a given day was associated with healthy eating behaviour through the reduction of stress. However, daily self-compassion was not associated with daily exercise behaviour.

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SUPPORTING INFORMATION

Additional supporting information may be found in the Supporting Information section at the end of the article.

Appendix S1 Supporting Information

REFERENCES


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