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Title: Exploring the role of self-kindness in making healthier eating choices: A preliminary study

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Abstract

Background: Food selection is an important factor in the prevalence of obesity, and regularly choosing **nutrient-poor high** energy foods can have negative health consequences. The present study tested whether the use of Mindful Construal Diaries (MCD) combined with self-kindness could promote healthier eating choices. **Methods:** Ninety participants were randomly assigned to either a self-kindness to the mind condition or self-kindness to the mind and body condition, and were served M&Ms and grapes as an unhealthy and healthy option, respectively. **Results:** The results suggested that a difference in consumption was found between the two conditions, with participants in the self-kindness to the mind condition consuming significantly more grapes than those in the self-kindness to the mind and body condition. However, this difference was restricted to those who are usually low consumers of fruit and vegetable. **Conclusions:** The effect of self-kindness towards promoting healthier eating whilst considering the body thus appears to require further investigation. Limitations and recommendations for future research are discussed.

Keywords: Self-compassion; Self-kindness; Food choices; Healthy eating; Unhealthy eating

Introduction

Encouraging healthier food choices appears to be crucial in improving weight management and addressing the current weight related chronic conditions, such as type 2 diabetes, cardiovascular disease and COVID-19 [1,2]. Mindfulness-based interventions have shown to positively influence healthier eating behaviours, and the inclusion of self-compassion to reinforce one's ability to be less self-critical is a foundational element within mindfulness practices [3, 4]. Recent literature has indicated that self-kindness, an element within self-compassion, may pose as a problematic area in health behaviour research and healthy changes within eating [5, 6]. The present research attempted to identify whether being kind to oneself is helpful (or not) when exploring a mindful eating intervention targeting decision making and consumption [7].

Mindfulness has been described as purposely paying attention to present moment experiences, non-judgmentally [8, 9]. Mindful eating, a term that describes the adaptation of mindfulness onto the behaviour of eating, has shown significant changes in weight regulation [7, 10, 11]. Eating is often described as an automatic and over-learned behaviour [12]. For example, people may eat simply in the presence of food, and not necessarily because they are hungry [13]. It has been suggested that engaging in a mindful eating approach encourages one to place a greater focus upon their internal cues of hunger and satiety, reducing the influence of external cues and eventually leading to healthier eating behaviours [10, 14]. In an attempt to induce a state of mindful eating, a "mindful concrete construal" diary (MCD) was developed [7]. The MCD combines elements of mindfulness and self-compassion, and using the MCD has demonstrated improvements in participants' mindfulness levels and eating patterns, such as reduced caloric intake [7, 15].

Self-compassion is described as treating oneself with the same understanding and concern as one would treat loved ones with when experiencing difficulties [16]. It consists of

three main elements: self-kindness, common humanity and mindfulness [16]. Literature suggests that the combination of both mindfulness and self-compassion promotes positive outcomes in eating behaviours, well-being and weight management [17, 18]. Yet, it is uncertain as to which specific elements of self-compassion improve healthier choices around food. One area that appears to be problematic within the concept of self-compassion is self-kindness [5]. Whilst it is commonly believed that being kind to oneself is beneficial when trying to lose weight, the influence that self-kindness may have upon physiological health is not so straightforward [5, 6]. For example, recent research found wide separations in behaviours regarding self-kindness, for some people self-kindness involved binge drinking or over-indulging on their favourite foods, for others it consisted of taking a warm bath or eating a healthy meal [6]. Whilst the former group's behaviour may lead to negative health consequences, and only refers to perceived kindness to the mind, the latter group's behaviour relates to self-kindness of both the mind and body, and therefore, is perhaps a truer model of self-compassion and the golden standard of self-care [16].

Whilst self-kindness may be a positive method of alleviating psychological distress, being kind to oneself does not necessarily mean that both physical and psychological health are attained simultaneously [6]. In practise, psychological health is often prioritised over physiological health, for example, someone who is on a weight loss diet and has had a stressful day may want to treat themselves by eating a chocolate cake instead of a portion of fruit because "they deserve it" [19]. By doing so, they are only showing perceived kindness to their mind, and if such behaviour is sustained continuously, it can make adhering to healthy eating difficult. Literature has also found a positive association between self-compassion and intake of fruit and vegetable [20], and more recently it was suggested that those who do not participate in the holistic care of self-compassion (i.e., displaying kindness to both the mind and body) may be less likely to consume nutrient-dense low energy foods

(e.g., fruit and vegetable) [6]. Priming participants who are usually low consumers of fruit and vegetable to be kind to both their mind and body may lead to a greater intake of healthier food choices **than those who are high consumers of fruit and vegetable. This is because low consumers may be prompted to change their food choices in order to demonstrate kindness to their mind and body, whereas high consumers already appear to express self-compassion and self-kindness to their mind and body [6, 20].** Therefore, exploring the state of self-kindness and the affect that it may **have** upon eating behaviours is an avenue that merits investigation.

This study will explore whether the MCD combined with self-kindness could promote healthier food choices. It is hypothesised that participants who simply consider the answers to the MCD **questions** combined with self-kindness to both the mind and body will be more likely to choose healthier food options than participants who consider the answers to the MCD combined with self-kindness solely to the mind. However, it is predicted that this effect will only occur in participants who are usually low consumers of fruit and vegetable, as they would be less likely to practise the holistic act of self-kindness on a daily basis [6].

Method

Participants

Ninety participants were recruited via opportunity sampling from a university in West Midlands, United Kingdom. Participants included both university and high school students, as well as parents and siblings of students. **Given the low and high consumer subset of the population pool,** an aim of exceeding a large effect size at power equalling .80 and $p = .05$, participant numbers were set at 18 for each group, and 45 for a medium effect size. The current study achieved a large-medium effect size [21]. The average BMI of the sample was $M = 24.32$ ($SD = 9.13$) and age was $M = 24.54$ ($SD = 10.83$). Participants self-identified ethnicities were: White or White British ($n = 55$), Black African or Caribbean ($n = 12$), Asian ($n = 19$), Chinese ($n = 2$), Arab ($n = 1$), and not specified ($n = 1$).

Eligibility. Participants were informed via an information sheet and consent form that they were not eligible to participate if they had been diagnosed with an eating disorder or if they had any nut allergies. **There were no other restrictions on participating.**

Experimental conditions

Participants were randomly assigned to one of the two experimental conditions. Participants in the self-kindness to the mind condition ($n = 45$) received a MCD [7] that was adapted with questions regarding kindness to one's mind and thoughts, such as, "*How do you feel and what passes through your mind now that you are eating this snack*" and "*How important is this snack for taking care of your thoughts and feelings right now*". Participants in the self-kindness to the mind and body condition ($n = 45$) were presented with a MCD adapted with questions regarding kindness to both the mind and body. Sample items of the diary include: "*How could this snack be better at taking care of your thoughts and physiological health right now?*" and "*How are you taking care of your emotions and your physical health now that you are eating this snack?*" Participants in both the conditions were asked to simply consider the answers to the adapted versions of the MCD in order to avoid any distractions that may occur from writing out answers [22, 23].

Procedure

The study was advertised as an experiment regarding food choices and personality in order to disguise the true aims of the study [15]. Experimental sessions took place between 12pm and 4pm and lasted approximately 25 minutes. Upon arrival, participants received an information sheet, and those who provided informed consent were seated in individual cubicles. Participants height and weight was first measured using a stadiometer and a digital scale, and they were then asked to complete demographic questions and a state self-compassion scale. Next, depending on the condition, participants were asked to either read the kindness to the mind MCD or kindness to the mind and body MCD for two minutes prior

to receiving the M&Ms and grapes [15]. Then participants were provided with the portion of M&Ms and grapes, and asked to continue reading and engaging with the MCD whilst eating. Participants were told they could choose any option of food they want (or both) and eat as much **or as little** as they **prefer**. After 5 minutes, the experimenter asked participants to finish eating and they were asked to complete another state self-compassion scale and a cognitive restraint scale. Once participants had completed the questionnaires, they were debriefed **about the study's true purpose**, and thanked for their participation.

Self-report measurements

Demographics: To assess background information, participants were asked questions on their age, ethnicity and how many hours prior they had eaten. **Hunger:** To assess hunger, participants were asked “*How hungry do you feel right now*” with responses ranging from 1 (*not at all*) to 5 (*extremely hungry*). **Fruit and vegetable consumption:** To assess daily fruit and vegetable consumption, participants were asked “*How many portions of fruit and vegetable do you normally eat a day?*” [24]. **State self-compassion scale:** To assess state self-compassion, participants completed the state self-compassion scale pre and post experimental task [25], and the present study produced alpha of pre ($\alpha = .84$) and post ($\alpha = .87$). **Cognitive restraint scale:** To assess diet tendencies, participants completed the cognitive restraint subscale of the Three Factor Eating Questionnaire [26], and the present study produced an alpha of ($\alpha = .78$). **Participants completed all questionnaires, and there was no missing data.**

Food

Participants in both conditions were provided with 100g portion of M&M peanuts (approximately 511 calories, 19g fat, 72g carbohydrate, 4g protein) and a 100g portion of green and red grapes (approximately 67 calories, 0.2g fat, 18g carbohydrate, 0.7g protein). The M&Ms and grapes were served in two separate white bowls with the size amounting to: width 15cm x length 15cm x height 8cm, and all food was sourced from UK Tesco stores.

Data analysis

Shapiro-Wilk test was used to determine normality. A median split on the usual fruit and vegetable intake measure resulted in low consumers categorised as participants consuming 2 or less portions of fruit and vegetables a day, and high consumers labelled as participants consuming 2.5 or more portions of fruits and vegetables a day. 2 X 2 ANOVAs with state self-compassion and energy intake from M&Ms and grapes as dependent variables were conducted, and any significant interactions were followed up with t-tests. **Participants who did not eat anything ($n = 5$) were excluded in a secondary analysis, and findings reported for the whole sample remained the same in regards to significance reporting. As such, all participants ($n = 90$) are included in the following analyses.**

Results

Participant characteristics

Fifty participants were labelled as low consumers of fruit and vegetables (daily portion: $M = 1.51$, $SD = .63$), whilst the remaining forty participants were identified as high consumers (daily portion: $M = 3.98$, $SD = 1.30$). Chi square analysis revealed that gender was equal across the two conditions $X^2(2) = .219$, $p = .34$, and t-tests found no significant differences in participants' hunger, prior hours eaten, BMI, age, fruit and vegetable consumption and cognitive restraint between the two conditions: all $p > .12$. Inclusion of hunger, prior hours eaten, BMI, age, cognitive restraint and gender as covariates in the analyses did not affect the observed results for any of the dependent measures, and are therefore not discussed further.

State self-compassion

A 2 X 2 ANOVA indicated a significant main effect of time $F(1,88) = 137.50$, $p < .001$, $\eta_p^2 = .61$ with state self-compassion scores being significantly higher within the post condition ($M = 78.72$, $SD = 15.32$) than the pre condition ($M = 66.19$, $SD = 12.85$). There

was no main effect of conditions $F(1,88) = .80, p = .38, \eta_p^2 = .01$, and there was no significant interaction between time X condition $F(1,88) = .004, p = .95, \eta_p^2 = .001$.

Food selection – Overall intake

A 2 X 2 ANOVA indicated no significant interaction between condition X usual fruit and vegetable intake $F(1,86) = .01, p = .95, \eta_p^2 = .001$, no significant main effect of conditions $F(1,86) = 1.07, p = .31, \eta_p^2 = .01$, nor of usual fruit and vegetable intake $F(1,86) = 2.43, p = .12, \eta_p^2 = .03$ on participants' total calorie intake (see Table 1).

Food selection – M&Ms

A 2 X 2 ANOVA indicated no significant interaction between condition X usual fruit and vegetable intake $F(1,86) = .11, p = .75, \eta_p^2 = .001$, no significant main effect of conditions $F(1,86) = .95, p = .33, \eta_p^2 = .01$, nor of usual fruit and vegetable intake $F(1,86) = 2.12, p = .15, \eta_p^2 = .02$ on participants' calorie intake of M&Ms (see Table 1).

Food selection – Grapes

A 2 X 2 ANOVA indicated a significant interaction between condition X usual fruit and vegetable interaction $F(1,86) = 7.68, p = .01, \eta_p^2 = .08$ on participants' calorie intake of grapes. There was no significant main effect of conditions $F(1,86) = .85, p = .36, \eta_p^2 = .01$, nor usual fruit and vegetable intake $F(1,86) = 2.22, p = .14, \eta_p^2 = .03$ (see Table 1).

Low consumers – Grape selection

For low consumers, there was a significant effect of self-kindness on participants' calorie intake of grapes $t(43.33) = 2.75, p = .01, d = .77$, whereby participants in the self-kindness to the mind condition consumed significantly more grapes than participants in the self-kindness to the mind and body condition (see Table 1).

High consumers – Grape selection

For high consumers, there was no significant difference between the self-kindness to the mind, and self-kindness to the mind and body condition in participants calorie intake of grapes $t(38) = 1.26, p = .21, d = .41$ (see Table 1).

INSERT TABLE 1

Discussion

The present study investigated whether or not the MCD combined with self-kindness could promote healthier food choices. Whilst a difference was found in the intake of healthy and unhealthy foods between the two conditions, it was limited and not consistent with the aforementioned hypotheses. The data suggested there were no significant differences in the consumption of M&Ms or grapes between self-kindness to the mind condition and self-kindness to the mind and body condition. However, participants who were typically low consumers of fruit and vegetable consumed significantly more grapes in the self-kindness to the mind condition compared to those in the self-kindness to the mind and body condition. Therefore, the findings suggest that the concept of self-kindness may not be so apparent when promoting healthier food choices, especially amongst low consumers of fruit and vegetable.

One possible interpretation of the results is that low consumers of fruit and vegetable may have altered their behaviour and consumed more grapes in the self-kindness to the mind condition because of the effect of mindful eating. For example, literature on mindful eating has demonstrated positive outcomes on promoting healthier eating choices [10, 11], and although the questions within the MCD were priming participants to be kinder to their mind, the diary was also encouraging participants to be more mindful. Previous research that has investigated the original MCD involving mindfulness and self-compassion [7] found the diary to be significantly effective in promoting healthier eating choices [15]. Furthermore, priming participants who are usually low consumers of fruit and vegetable to be kind to their mind and body was predicted to promote a greater intake of healthier foods (i.e., grapes).

However, the unexpected findings of low consumers displaying a greater intake of healthier foods in the self-kindness to the mind condition than those in the self-kindness to the mind and body condition appears to support the narrative that mindfulness may have been more influential than the concept of self-kindness. **Literature solely exploring mindful eating practices demonstrates a clear narrative of promoting healthier eating behaviours and weight regulation [7, 10].** Although, the improvements in self-compassion scores post intervention within the current study suggest that self-kindness was promoted, the concept of self-kindness within eating behaviours is still a novel and rather complex concept [5, 6]. Therefore, future research should use self-kindness as a sole intervention without the combination of mindfulness in order to thoroughly explore its effect on eating behaviours.

Moreover, the process of thinking about being kind to oneself may have induced more self-consciousness, and in effect promoted healthier eating behaviours [4]. For example, commercials on **lowering** sugar intake highlight the negative associations **of** sugar **on** the body. **As a result, people may consciously adapt their food choices in order to promote their physiological health [27].** The notion of promoting physical health may thus require a greater focus on mind elements, which could in effect result in better decision making around food.

Limitations and future directions

There are some potential limitations to the present study that require further discussion and investigation. First, the present study did not include a control group that was exposed to a non-self-kindness condition, and therefore did not allow an assessment on whether self-kindness had any significant direct effect. Future studies should include such a condition to allow a direct assessment on the effect of self-kindness in comparison to a conventional version of the intervention. **Additionally, considering how some analyses were underpowered when considering a medium effect size to be optimal in this type of research, future research needs to account for more participants.**

Furthermore, whilst previous studies have used a similar time-frame as the current research [28], and the current findings do suggest that hunger or hours prior eaten had no effect on the intake of healthy versus unhealthy foods. It may be possible that the time participants ate during the study affected their consumption [29]. Additionally, although participants with eating disorders and nut allergies were excluded from the current study, it could be possible that participants who had illnesses, such as type 2 diabetes may have been prohibited from consuming high sugar snacks. Therefore, controlling for such factors within future research may serve an enhanced and more tightly controlled experiment.

Finally, there was little variability in the BMI of the sample used, and people who are overweight or obese may have responded differently. For example, overweight and obese people may more often choose psychological health over physiological [30], and including these populations may provide different results.

Conclusion

The findings from the preliminary study suggest that mindfulness combined with self-kindness to the mind can encourage healthier eating, but this effect is limited, and restricted to lower consumers of fruit and vegetable. The concept of self-kindness requires further research to understand further its impact on eating behaviours and weight regulation.

Compliance with Ethical Standards - Ethical approval: All procedures have been approved by the institutional research committee of the University and have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. **Informed Consent:** Informed consent was obtained from all individual participants included in this study.

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Table 1. Means and Standard Deviations of Calories Consumed

	Mind Condition (<i>n</i> = 45)	Mind and Body Condition (<i>n</i> = 45)
Total intake	130.04 (146.62)	100.29 (142.94)
M&Ms	105.24 (137.88)	80.21 (132.64)
Grapes	24.80 (20.11)	20.08 (19.86)
<i>Low Consumers of Fruit and Vegetable (n = 50)</i>	Mind Condition (<i>n</i> = 26)	Mind and Body Condition (<i>n</i> = 24)
Grapes	27.00 (23.02)	12.00 (15.06)
M&Ms	83.69 (118.00)	65.07 (113.48)
<i>High Consumers of Fruit and Vegetable (n = 40)</i>	Mind Condition (<i>n</i> = 19)	Mind and Body Condition (<i>n</i> = 21)
Grapes	21.79 (15.32)	29.31 (20.93)
M&Ms	134.74 (159.84)	97.52 (152.66)

Standard deviations in parentheses.

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Conflict of Interest: The authors declare that they have no conflict of interest.

Declaration - Authors contributions: MH designed the study, collected data, conducted data analyses, and wrote the manuscript. HE, RK, and MM supported the study and critically reviewed the manuscript. All authors gave their final approval of the manuscript.