The Impact of Connectedness on Mental Health: Testing the Mediating Role of Eating Behaviour

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Abstract

Background/Aim. Connectedness refers to the extent to which individuals feel connected to themselves, others, and the world, and is increasingly recognised as an important factor in mental health. This study explored the relationship between connectedness, healthy eating behaviour, and mental health in adults. It was hypothesised that individuals' feelings of connectedness would predict better mental health and healthier eating behaviours, and that healthy eating behaviour would mediate the relationship between connectedness and mental health. *Method*. A quantitative cross-sectional research design was used. The data was collected using an online questionnaire completed by 90 participants (female = 70%, male = 28.89%, non-binary = 1.11%), aged between 18 and 67. The questionnaire measuring the three study variables included the Watts Connectedness Scale, the Healthy and Unhealthy Eating Behaviour Scale, and the Mental Health Continuum-Short Form. Regression and mediation analyses were conducted to test whether connectedness predicted mental health and healthy eating behaviour, and whether eating behaviour mediated the relationship between connectedness and mental health. *Results.* The regression analysis revealed that connectedness predicted mental health. The multiple regression analysis examining the three subdimensions of connectedness as predictors of healthy eating behaviour revealed only connectedness to the world as a significant predictor. The mediation analysis showed that eating behaviour did not mediate the link between connectedness and mental health. *Conclusion*. The finding that connectedness to the world predicts healthy eating underscores the potential of nature- or environment-focused interventions. Overall, the results emphasise the role of connectedness in mental health and point to the need for future research on alternative mediators and more objective measures of eating behaviour.

Introduction

Humans have an innate need for connectedness, a fundamental psychological requirement for mental health and personal growth (Baumeister & Leary, 1995). A strong sense of connectedness has been linked to various positive psychological outcomes, including greater emotional well-being, resilience, and life satisfaction (Baumeister & Leary, 1995; Oldershaw et al., 2019; Townsend & McWhirter, 2005; Watts et al., 2022). Connectedness with others is sought to be a protective factor for mental health, as social relationships can play a crucial role in recovery from psychological distress (Townsend & McWhirter, 2005). Conversely, a lack of connectedness has been linked to various mental health problems, including depression, PTSD, eating disorders, borderline personality disorder, and an increased risk of suicide (Baumeister & Leary, 1995; Watts et al., 2022; Vartanian & Hopkinson, 2010). Connectedness has therefore become an essential construct in mental health research and is recommended for clinical and therapeutic counselling settings due to its profound influence on psychological well-being (Townsend & McWhirter, 2005).

Given the rising prevalence of mental health issues and lifestyle-related diseases such as obesity (Sowers et al., 2019; Ellulu et al., 2014), understanding how connectedness influences healthy behaviours and psychological outcomes is of critical public health and clinical relevance. Accordingly, this study examines how connectedness relates to healthy eating behaviour and mental health, and whether eating behaviour mediates the relationship with mental health.

Connectedness

Watts et al. (2022) describe connectedness as a multidimensional concept encompassing the dimensions of connectedness to the self, others, and the world, which are interrelated and share a common underlying factor of general connectedness. As noted above, connectedness as whole, has been found to contribute positively to overall mental health (Watts et al., 2022; Townsend & McWhirter, 2005), defined by the WHO (2001) as a state of well-being where individuals realise their strengths, cope with daily stresses, work productively and contribute to society.

Connectedness to the self refers to an individual's ability to feel connected to the perceived self at a deeper level (Klussman et al., 2022 & Watts et al., 2022). Klussman et al. (2022) suggest that feeling connected with oneself involves three key aspects, namely being aware of oneself, accepting oneself based on this awareness and aligning one's actions with this perception. Furthermore, Watts et al. (2022) propose that a deep sense of self-connectedness also includes embodied and somatic dimensions, such as a heightened

awareness of the own body, sensory experiences and emotions. Research has shown that experiencing self-connectedness promotes meaning and relatedness to goals in life, psychological well-being and life satisfaction (Klussman et al., 2022). Connectedness to the self has also been shown to be related to connectedness to others, as feeling self-connected helps individuals communicate their values and engage in meaningful social activities, aligning with those of others (Klussman et al., 2022).

Connectedness to others refers to the quality and quantity of interpersonal connectedness, for instance, to social networks, family and friends (Townsend & McWhirter, 2005). Research has shown that humans have an innate need and motivation for interpersonal relationships and positive interactions (Baumeister & Leary, 1995; Townsend & McWhirter, 2005). Baumeister and Leary (1995) demonstrate that social connectedness is fundamental for individuals, stating that regular and meaningful interactions in enduring relationships are associated with better psychological well-being. Strong feelings of interpersonal connectedness promote psychological growth and positive emotions, while a lack of them leads to psychological distress (Baumeister & Leary, 1995). A lack of social connectedness has been associated with negative psychological outcomes, whereas individuals who feel more socially connected generally report lower levels of anxiety and higher self-esteem as well as fewer symptoms of depression (Lee & Robbins, 1998; Haslam et al., 2015).

Connectedness to the world comprises an individual's relationship with the wider environment, including nature, spirituality, or a sense of belonging to a greater purpose (Townsend & McWhirter, 2005; Watts et al., 2022). Watts et al. (2022) suggest that the connectedness to the world also encompasses the idea of self-transcendence, an individual’s capacity to grow beyond their own identity by expanding one's sense of self to deeper connections with others or with something greater than oneself, that is, to express a spiritual or transcendent presence. World-connectedness, especially connectedness to nature, seems to influence well-being positively, as research has shown that engagement with nature is related to a deeper sense of connectedness to others, nature and life and promotes prosocial orientation (Passmore & Holder, 2016). In addition, people who feel more connected to nature have been shown to experience greater vitality, and a better overall mood and therefore tend to be happier and more satisfied with their lives (Capaldi et al., 2014). In addition, connection with nature has been shown to lead to greater overall well-being and higher levels of personal growth (Pritchard et al., 2020).

In addition to the effects on mental health, connectedness may also influence lifestyle-related factors such as eating behaviour. Exploring these connections may provide further insight into how connectedness supports mental health.

Eating Behaviour

Eating behaviour refers to the quality and quantity of food and drink intake and is influenced by internal (genetic, physiological and psychological) and external, environmental factors (Tsegaye et al., 2020). Guertin et al. (2020) propose that healthy eating behaviour is related to the consumption of a wide variety of food products, especially fruits and vegetable-rich nutrition, as well as whole grain products and meat alternatives. Additionally, Pereira & Alvarenga (2007) characterise healthy eating as the consumption of wholesome foods that provide enough nutrients and calories to meet the body's needs, as well as maintaining a healthy relationship with food. In contrast, Guertin et al. (2020) describe unhealthy eating behaviour as an intake of high-calorie food and beverages with high amounts of fat, sugar, and salt. Furthermore, disordered eating behaviour is described as unhealthy eating habits which include unhealthy food intake, bingeing, purging, or extreme food restriction and can range to full-blown clinical eating disorders (Pereira & Alvarenga, 2007).

With the increasing prevalence of mental health problems and disordered eating patterns, as well as obesity (Sowers et al., 2019; Ellulu et al., 2014), it is essential to understand the role of healthy eating habits on mental health. Research suggests that a diet rich in fruits, vegetables, whole grains and fish is associated with a lower risk of depression, while a Western, highly processed diet is associated with an increased risk (Li et al., 2017; Rahe et al., 2014). McMartin et al. (2013) also confirm the positive effects of a healthy diet on mental health by showing that a higher intake of fruit and vegetables is associated with a lower risk of depression, psychological distress, mood and anxiety disorders and a poorer perception of mental health. In addition, overeating or difficulty losing weight, chronic dieting or restrictive diets are associated with negative emotional states and poor mental well-being (Polivy & Herman, 2005). The protective effect of a healthy diet can be attributed to its high antioxidant content, which reduces oxidative stress and protects neuronal function (Akbaraly et al., 2009). Given the links between eating habits and mental health, it is important to examine how connectedness might influence an individual's eating habits.

According to the literature, the three different forms of connectedness might play a role in individuals' eating behaviour. First, *self-connectedness* might be relevant for healthy eating behaviours, though direct research on this relationship remains scarce. Carbonneau et al. (2021) suggest that self-compassion involves treating oneself with kindness and

understanding. This self-compassion is associated with better diet quality and intuitive eating, mediated by improved body esteem (Carbonneau et al., 2021) and relates to self-connectedness, which involves self-awareness and self-acceptance (Klussman et al., 2022). In addition, Oldershaw et al. (2019) describe how individuals with conditions such as anorexia nervosa often struggle with a poorly integrated sense of (emotional) self, may use disordered eating as a means of self-affirmation and external validation. The lack of an integrated self may reflect low self-connectedness, indicating that a lack of self-connectedness is also linked to unhealthy eating habits.

Connectedness to others, such as relationships with family, friends and community, also appears to influence eating habits. Baumeister & Leary (1995) propose that the feeling of belongingness fosters emotional support, self-esteem, and perceived social value, which may encourage individuals to engage in healthier eating patterns. Research supports these ideas by finding that stronger feelings of belonging were significantly associated with healthier eating habits and a more positive body image (Larson et al., 2011). Furthermore, research found that lower social connectedness was linked to higher conformity, which increased internalisation of societal beauty standards, which in turn, predicted greater body image concerns, dietary restraint, and bulimic symptoms (Vartanian and Hopkinson, 2010). Additionally, Gilder et al. (2024) found that the quality of social relationships is associated with better weight loss outcomes in individuals participating in obesity treatment programs.

Lastly, research on the relationship between *connectedness to the world* and eating behaviours is scarce; however, existing studies suggest that they might be related. Nature-connectedness, which is part of connectedness to the world, has been shown not only to increase mental health but also to influence people's food choices (Bruno et al., 2021). Stronger feelings of connectedness to nature, particularly following nature-based interventions, have been associated with healthier and more sustainable eating habits (Bruno et al., 2021). Despite these findings, the broader role of connectedness to the world in shaping eating behaviours remains unexplored, highlighting the need for further research in this area.

This Study

While research shows that connectedness has a positive influence on mental health (Townsend & McWhirter, 2005; Larson et al., 2011; Oldershaw et al., 2019) and that healthy eating habits are associated with better mental health (Li et al., 2017; Rahe et al., 2014; McMartin et al., 2013), there is scarce research on how connectedness might influence eating behaviour (Carbonneau et al., 2021; Vartanian & Hopkinson, 2010; Bruno et al., 2021). This study attempts to fill this gap by examining whether healthy eating behaviour serves as a

mediator through which connectedness supports mental health. Understanding these relationships has important implications for public health, as findings may influence prevention strategies and clinical interventions that improve mental well-being by promoting connectedness and healthy eating habits. Consequently, based on previous research, the following hypotheses were formulated:

H1: Higher levels of connectedness are positively associated with better mental health outcomes

H2: Higher levels of connectedness to the self, others, and the world are each positively associated with healthier eating behaviour.

H3: Healthy eating behaviour mediates the relationship between connectedness and mental health.

Method

Design

In the present study, a quantitative cross-sectional research design was used to investigate the relationships between connectedness, eating behaviours, and mental health using an online questionnaire.

Participants

Participants were recruited using convenience sampling via the University of Twente's SONA system, an online platform where students sign up for research studies to earn course credits, as well as through announcements in group chats with fellow students and the researchers' networks. The conditions for participation required participants to be at least 18 years old, fluent in English, and to sign a consent form, all of which were met by all participants. Of the 113 people who started the survey, 23 were excluded due to incomplete responses, leaving a final sample of 90 adults. They consisted of 63 females (70%), 26 males (28.89%) and one non-binary participant (1.11%) between 18 and 67 years (M = 27.40, SD = 11.19). Within this sample, 75 (83.33%) participants were German, seven (7.78%) were from other European countries, six participants (6.67%) were Dutch, and two (2.22%) were from non-European countries. Regarding occupational status, 56 were students (62.22%), 28 were working (31.11%), two were in an apprenticeship (2.22%), and one reported the status “other” (1.11%).

Materials

Demographics

The participants were asked to complete a questionnaire with five demographic inquiries concerning their age, gender, nationality, level of education and occupation status.

Connectedness

The Watts Connectedness Scale (WCS; Watts et al., 2022) is a newly developed multidimensional scale that was utilised to assess participants' levels of connectedness. This scale has been designed to comprehensively measure the concept of connectedness by including three separate subscales that measure connectedness to self, others and the world (Watts et al., 2022). The scale consists of 19 items rated on a continuous scale from 0 (Not at all) to 100 (Entirely), based on how participants have felt over the past two weeks. Each of the three subscales captures a distinct dimension of connectedness, with example items such as “I have been able to fully experience emotion, whether positive or negative” (self-connectedness), “I have felt connected to friends and/or family” (connectedness to others), and “I have felt connected to a purpose in life” (connectedness to the world) (see Appendix A). The WCS has demonstrated satisfactory internal consistency and overall adequate construct validity (Watts et al., 2022). In this study, the value for Cronbach’s Alpha for the questionnaire was $\alpha = .84$, indicating high internal consistency.

Eating Behaviour

The Healthy and Unhealthy Eating Behaviour Scale (HUEBS), a scale developed by Guertin et al. (2020), was utilised to assess participants' healthy and unhealthy eating behaviours. The scale comprises 22 items, divided equally between two subscales with 11 items measuring healthy eating behaviours (e.g., "I eat vegetables"), while the remaining 11 items capture unhealthy eating behaviours (e.g., "I eat foods that are deep-fried") (see Appendix C). Each item is rated on a 7-point Likert scale ranging from "never" (1) to "always" (7), thereby providing a comprehensive understanding of the participants' dietary habits. Items from the unhealthy eating subscale were reverse-scored so that higher total scores reflect a greater tendency toward healthy eating overall. The scale has demonstrated high internal consistency for both subscales and has been validated in prior research to show strong psychometric properties (Guertin et al., 2020). In this study, Cronbach’s alpha for the scale was $\alpha = .80$, indicating good internal consistency.

Mental Health

The Mental Health Continuum-Short Form (MHC-SF) was utilised to assess the mental health of the participants. This concise assessment tool quantifies individuals’ mental

health through 14 items distributed across three subscales: emotional, psychological and social well-being. Participants rated each item on a 6-point Likert scale from “never” (1) to “every day” (6), based on how frequently they experienced various aspects of mental health over the past month. Example items include “How often did you feel happy?” (emotional well-being), “How often did you feel that your life has a sense of direction or meaning to it?” (psychological well-being), and “How often did you feel that people are basically good?” (social well-being) (see Appendix B). While the MHC-SF exhibits high internal reliability, its test-retest reliability is categorised as moderate. In addition, the test has demonstrated a high degree of convergent and discriminant validity (Lamers et al., 2010). In this study, the value for Cronbach’s Alpha for the questionnaire was $\alpha = .91$, indicating high internal consistency.

Procedure

The study received ethical approval from the University of Twente's ethics committee (application number: 250591). Participants completed the online questionnaires via the platform Qualtrics in a single session, which took approximately 30 minutes. When starting the questionnaire, participants were provided with an informed consent form outlining the purpose of the study, confidentiality measures, and their right to withdraw at any time. They were instructed to answer all questions as honestly as possible. All participants voluntarily agreed to take part and gave their electronic consent before participation. The survey followed a fixed order for all participants: first, they completed demographic questions, followed by the connectedness questionnaire, the mental health questionnaire, and finally, the eating behaviour questionnaire. Participants were required to answer all items before proceeding. After completing the questionnaire, participants were thanked for their participation, and those who took part via the University of Twente’s Sona platform received 0.5 Sona credit points, a total of 37 participants. To safeguard confidentiality, participant data were anonymised, and assurances were given that responses would be kept confidential and utilised solely for research purposes. Data collection took place from the 31st of March to the 17th of April 2025.

Data Analysis

The data collected from the questionnaires was analysed using descriptive and inferential statistical methods. All statistical analyses were conducted using R statistical software. Therefore, the packages “tidyverse”, “broom”, “psych”, “psychtools” and “dplyr” were loaded. The data set was first imported from Qualtrics into RStudio, and data cleaning was performed; thus, it was ensured that all responses were correctly coded and formatted, and participants who did not complete the entire questionnaire were excluded. The data were

screened for outliers and response patterns, but no such tendencies were found. Descriptive statistics were calculated, and correlations were calculated between all study variables using Pearson's R correlations. All statistical analyses were performed using R statistical software, with a significance level set at $p < 0.05$. Histograms of the total scores were created for each questionnaire to visually assess the distribution of the data. The distributions of connectedness, its three subscales, mental health and healthy eating behaviour appeared approximately normal, indicating that the assumptions for parametric tests were met.

To test the first hypothesis, a regression analysis was performed with connectedness as the independent variable and mental health as the dependent variable. For the second hypothesis, a multiple regression analysis was performed with the three connectedness subdimensions connectedness to the self, others, and the world as independent variables and healthy eating behaviour as the dependent variable.

Lastly, the potential mediating role of healthy eating behaviours in the relationship between connectedness and mental health was explored. Therefore, mediation analyses were conducted using the "mediation" package in RStudio. This involved specifying two regression models: one predicting healthy eating behaviour from connectedness, and one predicting mental health from both connectedness and healthy eating behaviour. The Average Causal Mediation Effect (ACME), representing the indirect effect and the Average Direct Effect (ADE) of connectedness on mental health, were estimated. The significance of the indirect effect was tested using nonparametric bootstrapping with 5000 simulations.

Results

Descriptive Statistics

Descriptive statistics, including correlations among the study variables connectedness, its subscales, mental health and healthy eating behaviour, are presented in Table 1. On average, participants scored around the midpoint of each scale for connectedness, its subscales and mental health, suggesting moderate levels across these variables. Healthy eating behaviour scores were moderate to high compared to the scale range.

All correlations were significantly positive, except those between healthy eating behaviour and overall connectedness, connectedness to the self, and connectedness to others. Additionally, healthy eating behaviour was not correlated with mental health.

Table 1

Means, Standard Deviations, and Correlations Among Study Variables

Variable	*M*	*SD*	1	1.1	1.2	1.3	2
1. Connectedness (0-100)	59.42	14.17	—				
1.1. CTS (0-100)	65.24	15.96	**.72***	—			
1.2. CTO (0-100)	65.92	20.87	**.76***	**.27****	—		
1.3. CTW (0-100)	47.11	18.90	**.80***	**.47***	**.37***	—	
2. Mental Health (14-84)	53.49	11.97	**.77***	**.32****	**.70***	**.68***	—
3. Healthy EB (22-154)	101.5	13.40	.18	.14	.02	**.26****	.20

Note. CTS = connectedness to the self, CTO = connectedness to others, CTW = connectedness to the world, EB = Eating Behaviour, *p < .001. **p <.05

Regression Analysis

A regression analysis was performed to assess the extent to which connectedness could predict mental health. A significant regression was found ($F(1, 88) = 127.5$, $p < .001$, $R^2 = 59$). In line with the first hypothesis, connectedness significantly predicted mental health ($\beta = 0.65$, $t(88) = 11.29$, $p < .001$).

A multiple linear regression was conducted to examine whether connectedness to self, others, and the world significantly predicted total healthy eating behaviour scores. The overall model was not statistically significant ($F(3, 86) = 2.34$, $p = .079$, $R^2 = .076$). Of the three predictors, only connectedness to the world was a significant positive predictor ($\beta = .20$, $t(86) = 2.29$, $p = .025$), while connectedness to self ($\beta = .03$, $t(86) = 0.25$, $p = .802$) and others ($\beta = -.06$, $t(86) = -.82$, $p = .416$) were not significant. These results partially support the second hypothesis. While connectedness to the world significantly predicted healthier eating behaviour, connectedness to the self and others did not.

Mediation Analysis

To test whether healthy eating behaviour mediates the relationship between connectedness and mental health, a causal mediation analysis was conducted (see Table 2 for detailed results). The direct effect of connectedness on mental health was significant. However, the indirect effect was not statistically significant. Therefore, the third hypothesis is rejected, as although connectedness played a role in predicting mental health, eating behaviour did not significantly mediate this relationship.

Table 2

Mediation Analysis Connectedness, Mental Health via Healthy Eating Behaviour

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	.01	-.02	.04	.50
ADE	.64	.52	.76	< .001
Total Effect	.65	.53	.76	< .001
Proportion Mediated	.015	-.03	.07	.50

Note. ACME = Average Causal Mediation Effect, ADE = Average Direct Effect, N = 90. Simulations = 5000

Given that the regression analysis showed that the subscale connectedness to the world did significantly predict healthy eating behaviour, an additional exploratory mediation analysis was conducted to examine whether healthy eating behaviour mediates the relationship between connectedness to the world and mental health. However, as shown in Table 3, while the direct effect also remained significant in this analysis, the indirect effect was not statistically significant.

Table 3

Mediation Analysis Connectedness to the World, Mental Health via Healthy Eating Behaviour

	Estimate	95% CI Lower	95% CI Upper	p-value
ACME	.00	-.04	.03	.81
ADE	.42	.52	.52	< .001
Total Effect	.43	.53	.52	< .001
Proportion Mediated	.00	-.09	.08	.81

Note. ACME = Average Causal Mediation Effect, ADE = Average Direct Effect, N = 90. Simulations = 5000

Discussion

This study investigated whether connectedness predicts mental health and if healthy eating mediates this relationship. Results showed that connectedness significantly predicted mental health. However, only connectedness to the world was associated with healthier eating behaviours, while the dimensions connectedness to the self and others were not. No evidence

was found for a mediating role of eating behaviour in the relationship between connectedness and mental health. These findings underscore the value of connectedness for people's mental health and highlight the potential of promoting a sense of connectedness to the world as part of public health strategies to support healthier eating habits.

Theoretical Discussion

Consistent with previous studies, connectedness was a strong predictor of mental health, supporting its role in fostering life satisfaction, psychological growth, and well-being (Klussman et al., 2022; Baumeister & Leary, 1995). By examining connectedness as a multidimensional construct in a non-clinical sample, this study extends prior research that focused mainly on clinical populations or considered connectedness as part of other psychological constructs (Townsend & McWhirter, 2005). The results provide insights that are relevant to public health, underscore the importance of promoting connections to oneself, others and the world in psychological interventions. For instance, interventions that enhance social connectedness can reduce burnout and improve mental health (Reyes Ortega et al., 2019). Furthermore, interventions in natural environments enhance mental health outcomes, suggesting that fostering connectedness to nature may amplify the effects of existing therapies (Choe et al., 2020).

The lack of association with self-connectedness and eating behaviour may indicate limited generalisability from clinical samples to healthy population groups. While low self-connectedness has been linked to eating disorders in clinical samples (Oldershaw et al., 2019), participants in this study were non-clinical with rather healthy eating habits. In clinical populations, self-related disturbances are often central to the psychopathology (Amianto et al., 2016), making self-connectedness a more direct predictor of maladaptive eating behaviours. In contrast, in non-clinical groups, eating patterns are likely influenced more by other factors than by self-connectedness alone, as Mantilla & Birgegård (2015) found stronger associations between self-image and disordered eating in young clinical samples, but weaker associations in older, psychologically healthier individuals. The lack of association between self-connectedness and healthy eating could also be due to the conceptual difference between self-connectedness and self-compassion. While self-connectedness refers to an awareness and acceptance of oneself as an integrated whole (Klussman et al., 2022), it lacks the emotional component of kindness and a non-judgmental attitude towards oneself that is emphasised in self-compassion (Neff, 2003). Since self-compassion has been shown to predict healthy eating (Carbonneau et al., 2021), the absence of this emotional aspect in self-connectedness could explain its insignificant association with eating behaviour in this study.

Connectedness to others also did not significantly predict healthy eating behaviours, contrasting with previous findings that highlight the positive impact of social relationships on healthier diets (Baumeister & Leary, 1995; Gilder et al., 2024). This suggests that general feelings of connectedness to others may not reflect the quality or nature of social influence. For instance, peer influence among adolescents can lead to increased consumption of unhealthy foods, though it can also promote healthier choices when properly guided (Ragelienė & Grønhøj, 2020). Furthermore, maternal thin-ideal internalisation has been shown to predict increases in adolescent bulimic symptoms (Linville et al., 2011). Thus, social connectedness alone may not sufficiently predict eating behaviour without considering the quality and content of social influences, such as parental attitudes and peer norms.

The finding that connectedness to the world significantly predicted healthy eating behaviour suggests that individuals who feel connected to a larger whole, through nature, spirituality, or the environment, as measured in the questionnaire, are more likely to eat healthily. This aligns with research linking nature-connectedness to healthier diets (Bruno et al., 2021). Such individuals may be more mindful of food origin and quality, consistent with Krizanova et al. (2021), who found that pro-environmental behaviour predicts adherence to plant-based diets, which offer both environmental benefits and health advantages like reduced morbidity and mortality (Barrett, 2022). While prior research has focused on nature-connectedness (Bruno et al., 2021), this study's broader concept of world-connectedness offers new insights, suggesting that promoting global or ecological connectedness, via mindful eating, plant-based diets, or sustainability campaigns, can improve eating behaviours. Interventions based on sustainability, the environment or contact with nature may be particularly effective (Shaw et al., 2019; Sobko et al., 2017). Thus, linking healthy eating to environmental or global awareness may promote lasting behavioural change and benefit public health.

Finally, no mediation effect of eating behaviour on the link between connectedness and mental health was found. Although connectedness to the world was significantly associated with healthy eating behaviour, an exploratory mediation analysis indicated that healthy eating also did not mediate its relationship with mental health. The mediation and correlation analyses indicated no significant association between healthy eating behaviour and mental health, which explains why dietary patterns did play a key role in linking connectedness to mental health in this sample. As discussed above, self-compassion has been associated with healthier eating (Carbonneau et al., 2022) and with mental well-being (Neff, 2003) and may therefore serve as a more relevant mediator. Psychological factors such as

self-esteem, resilience or mindfulness could also mediate this link, as these have been shown to positively influence mental health (Hwang et al., 2016; Enkema et al., 2020; Gao et al., 2017) and seem to possibly be predicted by connectedness (Lee & Robbins, 1998; Howell et al., 2011; Richards, 2016). Lastly, other lifestyle factors might serve as mediators. For example, physical activity, known to improve mental health and reduce anxiety and depression (Paluska & Schwenk, 2000), has been linked to both cultural (Ironside et al., 2020) and social connectedness (Kaczynski & Glover, 2012). Future studies should investigate these mediators to clarify the mechanisms linking connectedness to mental health.

Strengths, Limitations and Future Directions

A key strength of this study lies in its focus on connectedness as a multidimensional construct, explicitly distinguishing between connection to the self, to others and to the world, and their significance for mental health. Furthermore, it expands on previous research findings by examining these relationships using a non-clinical sample and provides new insights into how connectedness outside of clinical contexts serves as a predictor of mental health. Lastly, its novel focus on connectedness to the world goes beyond prior research on nature-connectedness. By showing its link to healthy eating, the study provides new insights and practical implications for health promotion strategies.

However, some potential limitations of this study must be considered. Although the study used validated instruments with high internal consistency, the use of self-report measures carries the possibility of response bias, such as socially desirable behaviour or inaccuracies in self-perception. These types of biases are well-documented in health research and can lead to both under- and overestimation of behaviours and outcomes when compared to objective measures (Gorber & Tremblay, 2016). Thus, especially assessing eating behaviour through a brief questionnaire may not adequately reflect individuals' dietary habits in terms of both quality and quantity. Therefore, future research could use more objective methods, like a week-long food diary with photos, to more accurately assess eating behaviour and clarify its link to connectedness and mental health.

Moreover, the sample consisted mainly of young, mentally healthy and Western individuals. Given the convenience sampling, mainly addressing students and individuals within the researcher's network, and the predominantly German student background, the sample can be assumed to be relatively socioeconomically advantaged. This lack of diversity may limit the generalisability of the results to other population groups and could partly explain the lack of a significant relationship between connectedness and healthy eating behaviour. As Foroozanfar et al. (2022) show, individuals with higher socioeconomic status

tend to have healthier eating behaviours than those with lower socioeconomic status, which is likely due to better access to and affordability of healthy foods, as well as better nutritional knowledge. These factors could explain why this sample exhibits healthier eating habits. Future research should therefore include more socioeconomically and clinically diverse populations to better understand if and how connectedness is related to healthy eating behaviours.

Lastly, the cross-sectional design of this study does not allow for making causal claims. Even if it shows that connectedness predicts mental health and connectedness to the world predicts healthy eating behaviour, causal inferences cannot be made. Future research should therefore adopt longitudinal designs to track changes in connectedness, dietary behaviours, and mental health over time, as this study design allows for making causal claims (VanderWeele et al., 2020).

Conclusion

In this study, the relationship between connectedness, healthy eating behaviour and mental health was investigated, and the hypotheses were partially confirmed. The feelings of connectedness of participants predicted their mental health, emphasising the value of promoting connectedness in psychological interventions, also in a non-clinical population. However, connectedness did not significantly predict healthy eating behaviours, nor did healthy eating behaviours mediate the relationship between connectedness and mental health, highlighting the need for further investigation of potential mediators. Connectedness to the world was found to predict healthy eating behaviour, which has important public health implications. Promoting this form of connectedness may serve as an effective strategy to encourage healthier eating habits through targeted prevention and clinical interventions. Although the results can be generalised based on the validated measurements, possible self-report bias and the lack of diversity in the sample should be considered. Future studies should therefore use more objective measures to investigate the interplay between connectedness, eating behaviour and mental health further. In addition, the use of longitudinal studies would allow causal inferences to be made, and the inclusion of more socioeconomically and clinically diverse samples would improve the generalisability of the results.

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Appendix A

Questionnaire Items Watts Connectedness Scale

1. I have felt trapped in my mind.
2. My mind has felt connected to my heart/emotion.
3. I have felt connected to my senses (touch, taste, sight smell, hearing).
4. I have felt connected to a range of emotions.
5. If I had chosen to, I could have 'sat with' painful memories.
6. I have felt connected to my body.
7. I have been able to fully experience emotion, whether positive or negative.
8. I have felt alone.
9. I have felt connected to friends and/or family.
10. I have felt connected to a community.
11. I have felt connected to all humanity.
12. I have felt unwelcome amongst others.
13. I have felt separate from the world around me.
14. I have felt connected to a purpose in life.
15. I have felt connected to nature.
16. I have felt connected to a spiritual essence (in the secular or religious sense).
17. I have felt connected to a source of universal love.
18. I have seen things from a broad perspective, 'the bigger picture'.
19. I have felt that everything is interconnected.

Appendix B

Questionnaire Items MHC-SF

1. During the past month, how often did you feel happy.
2. During the past month, how often did you feel interested in life.
3. During the past month, how often did you feel satisfied with life.
4. During the past month, how often did you feel that you had something important to contribute to society.
5. During the past month, how often did you feel that you belong to a community (like a social group, or your neighbourhood).
6. During the past month, how often did you feel that our society is a good place, or is becoming a better place, for all people.
7. During the past month, how often did you feel that people are basically good.
8. During the past month, how often did you feel that the way our society works makes sense to you.
9. During the past month, how often did you feel that you liked most parts of your personality.
10. During the past month, how often did you feel good at managing the responsibilities of your daily life.
11. During the past month, how often did you feel that you had warm and trusting relationships with others.
12. During the past month, how often did you feel that you had experiences that challenged you to grow and become a better person.
13. During the past month, how often did you feel confident to think or express your own ideas and opinions.
14. During the past month, how often did you feel that your life has a sense of direction or meaning to it.

Appendix C

Questionnaire Items HUEBS

Healthy Eating

1. I eat fruits
2. I eat vegetables
3. I eat whole grains (e.g., brown rice, buckwheat, quinoa, oats)
4. I eat foods that are low in saturated fats and cholesterol

5. I eat foods that are high in monounsaturated and polyunsaturated fats (e.g., fish, olive oil, avocados, nuts and seeds)
6. I use natural sweeteners (e.g., raw honey, maple syrup, coconut sugar, dates)
7. I drink water
8. I eat foods that are boiled, steamed, grilled, or poached
9. I eat lean meats, such as poultry, fish, and eggs
10. I eat low-fat dairy products (e.g., low-fat milk, yogurt, sour cream, cheese)
11. I eat legumes (e.g., beans, lentils, peas, peanuts)

Unhealthy eating

1. I eat refined grains (e.g., white rice, white bread, white flour)
2. I use white sugar or artificial sweeteners
3. I eat snack foods, such as chips, chocolate, and/or candy
4. I drink sugar-sweetened beverages, such as soft drinks, fruit juices, and sports drinks
5. I eat foods that are deep-fried (e.g., fries, fried chicken)
6. I eat frozen and/or pre-packaged meals
7. I eat processed meats, such as sausages, bacon, and/or cold-cuts
8. I add salt to my food
9. I eat fast-food
10. I eat pastries and/or baked goods (e.g., croissants, pie, cake, muffins, brownies)
11. I consume more than 10 alcoholic drinks (for women) and more than 15 alcoholic drinks (for men) per week