Master thesis:

Pilot study on the feasibility and preliminary effectiveness of an online wellbeing course – a mediation model of perceived stress and wellbeing

Lea Berkemeier

s1811800

University of Twente

First Supervisor: Dr. E.J. De Bruin

Second Supervisor: Dr. S.M. Kelders

Faculty: Science and Technology (TNW)

Abstract

Mindfulness interventions have repeatedly shown to be successful in decreasing high perceived stress and improving wellbeing among university students. The current pilot study investigated the preliminary feasibility and effectiveness of a short, online wellbeing course for students. Prediction models of perceived stress and wellbeing were investigated, and a mediation model with mindfulness as a mediator variable was tested. Forty-nine participants filled in six surveys over time intended to measure the effectiveness with different proposed variables. Eleven participants also took part in an interview to evaluate the feasibility of the course. Results indicated that the participants evaluated the online well-being course as feasible in terms of the amount of time, setting, and content. Furthermore, participation in the online wellbeing course significantly reduced perceived stress scores over time and significantly increased wellbeing scores over time. The predictor variables of resilience and sense of belonging were found to significantly predict perceived stress. For wellbeing, the variables of COVID-19 Impact and mindfulness were found to significantly predict wellbeing. Furthermore, mindfulness did not have any mediating effects between adherence levels and the predictor or outcome variables. The current study results indicate that the short online well-being course presents a feasible and effective intervention for universities. For future research, another pilot or follow-up study should be conducted to refine the intervention and confirm the current results.

Keywords: mindfulness, effectiveness, feasibility, online intervention, perceived stress, wellbeing

Pilot study on the feasibility and preliminary effectiveness of an online wellbeing course

Previous research has repeatedly shown elevated levels of stress and decreased levels of wellbeing among university students (Conley, Shapiro, Huguenel, & Kirsch, 2020). More specifically, an increase in distress throughout the first study year and a substantial decrease in psychological wellbeing throughout a 3-year degree were reported (see Barrable, Papadatou-Pastou, & Tzotzoli, 2018). Overall, it was shown that university students experience significantly more psychological distress than the general population (Adlaf, Gliksman, Demers, & Newton-Taylor, 2001; Bayram & Bilgel, 2008; Cooke, Bewick, Barkham, Bradley, & Audin, 2006; Stallman, 2010) and are also considered a high-risk population for mental disorders (Eisenberg, Hunt, & Speer, 2013; Larcombe et al., 2016; Stallman, 2010). In addition, high levels of stress and low levels of wellbeing often result in a decreased academic performance, decreased empathy, and course or study withdrawal (see Crowther, Robertson, & Anderson, 2020; Lin & Huang, 2014; Schaufeli, Martinez, Pinto, Salanova, & Bakker, 2002). These results were already a growing concern before the COVID-19 pandemic, however, research has indicated that the pandemic seems to exacerbate the problem (see Kwan et al., 2021). Taking a look at the situation of University of Twente students, research by Kelders, Oberschmidt, and Bohlmeijer (2019) indicated that students experience relatively high-stress levels and also slightly lower wellbeing levels in comparison to other college student groups worldwide (see Morrison & O'Connor, 2005; Deckro et al., 2002). Several regression models were created that identified, among other things, predictors for wellbeing and perceived stress (see Kelders et al., 2019).

The recommendations of Kelders et al. (2019) were used as a starting point for this study as they highlight the need for an effective intervention to mitigate these problems. Previous studies have shown the ability of behavioral, cognitive and mindfulness interventions to successfully reduce student stress (Bamber & Morpeth, 2019; Regehr, Glancy, & Pitts, 2013). Furthermore, it was recommended for future research to test a preventive approach towards mental wellbeing, conduct longitudinal research of mental health and evaluate a low threshold intervention aiming at improving predictors of perceived stress and wellbeing (Kelders et al., 2019). Therefore, for the current study, an online intervention will be implemented and evaluated based on the measurements that were used in the study of Kelders et al. (2019). It will be expected that the prediction model of perceived stress and the prediction model of wellbeing can be repeated (see Kelders et al., 2019). In contrast to Kelders et al. (2019), the concept of mindfulness will be added and measured in this study due to its repeatedly shown connection with stress and wellbeing. However, no interventions have been yet developed for

students that aim at increasing wellbeing and decreasing the overall stress levels during the COVID-19 circumstances, which will be the main focus of this study.

Literature review

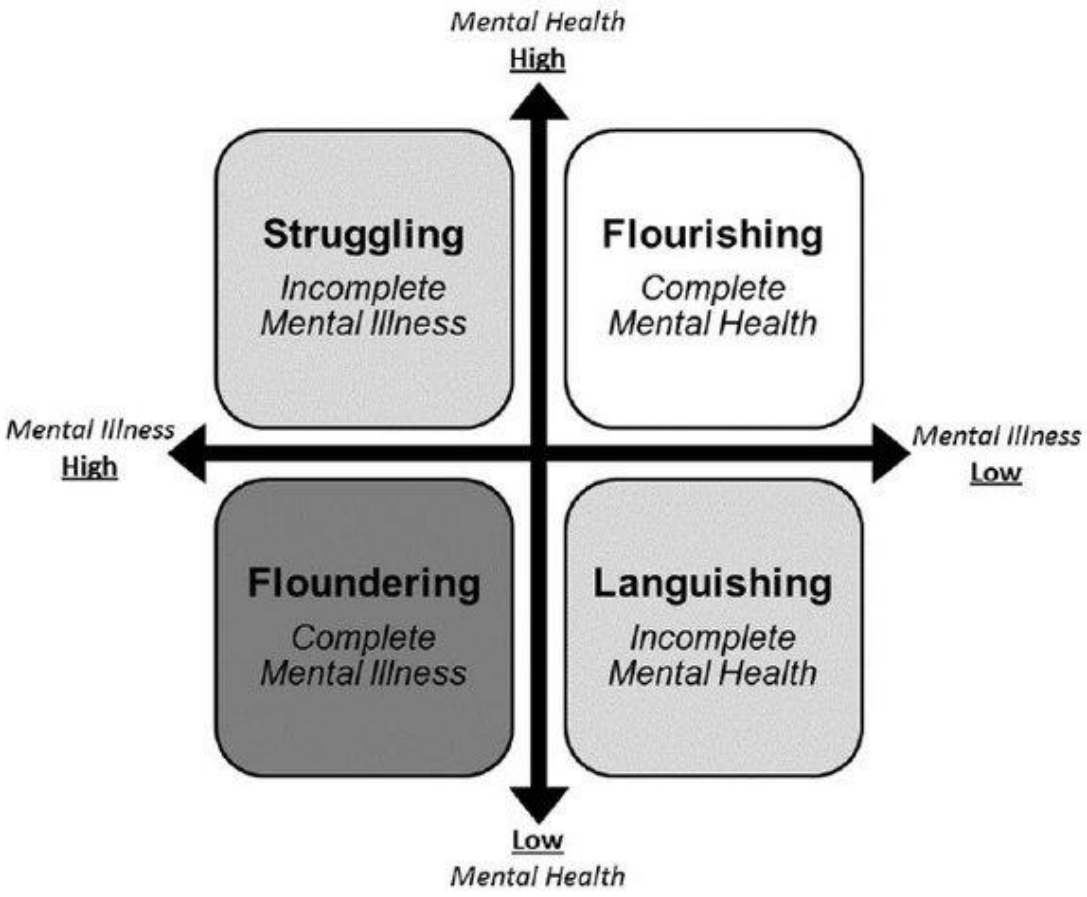
Mental health and wellbeing

According to the World Health Organization (n.d.), mental health is defined as "a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community". Previous research has shown that maintaining good mental health can be quite challenging for undergraduate university students, with many students tending to feel lonely, worry about academic demands or feel overwhelmed (Blanco et al., 2008; Laidlaw McLellan, & Ozakinci, 2016; Lipson, Zhou, Wagner, Beck, & Eisenberg, 2016; Larcombe et al., 2016; Cook, 2007; Herrero et al., 2019). The traditional model of mental health is often based on the Diagnostic and Statistical Manual of Mental Disorders (DSM), which "includes the diagnostic standards and therapeutic plans for more than 340 kinds of mental or psychopathologic illness, but it does not actually relieve psychological patients from the pain" (Wang, Zhang, & Wang, 2011, p. 767). Possible deficiencies of the DSM model include the one-dimensionality of mental health, the negative indicators of diagnosis and that mental health is rather just a by-product of no mental illness (Wang et al., 2011; Suldo & Shaffer, 2008). In other words, mental health and mental illness are seen as the opposite extremes of a continuum.

However, research has repeatedly shown that wellbeing is not simply the absence of a mental illness since one can experience to some extent a mental illness but still have a positive level of well-being (Ryan & Deci, 2001; Peter, Roberts, & Dengate, 2011). Due to these limitations, a new and scientific mental health model was developed, the so-called Dual-Factor Model of Mental Health (DFM), which has its roots in the area of positive psychology. In comparison to the DSM model, the DFM model includes more positive indicators such as subject well-being in the mental health assessment and views mental health as a two-dimensional construct (see Figure 1). In other words, well-being and mental illness are two separate but co-occurring factors that contribute to the overall functioning of an individual (Westerhof & Keyes, 2010).

Figure 1

Dual-Factor Model of Mental Health of Keyes and Lopez (2002)



Looking more closely at the concept of wellbeing, there is usually a distinction made between emotional, psychological, and social wellbeing (Lamers, Westerhof, Bohlmeijer, ten Klooster & Keyes, 2011). In general, the concept of wellbeing is quite complex due to its multi-dimensionality and dynamics, however, an attempt was made by Dodge, Daly, Huyton, and Sanders (2012, p. 230) defining stable wellbeing as "when individuals have the psychological, social and physical resources they need to meet a particular, social and/or physical challenge. When individuals have more challenges than resources, the see-saw dips, along with their wellbeing, and vice-versa". Whether an individual feels that she or he can meet a challenge is also closely connected to how she or he evaluates and perceives a stressor event, therefore, the construct of stress will be discussed in the following.

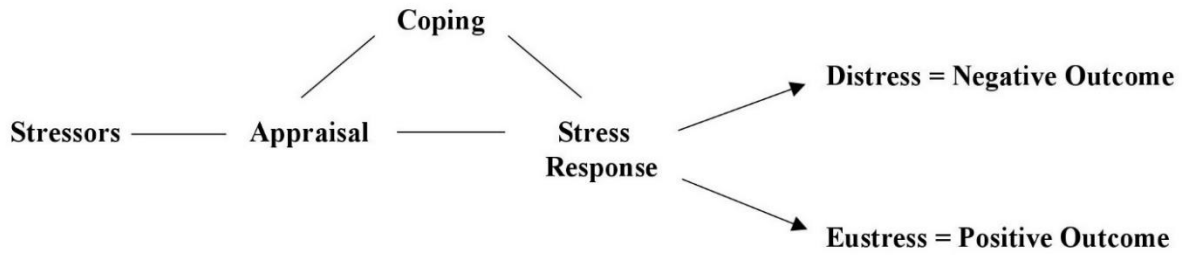
Perceived stress

According to Lazarus and Launier (1978), stress is defined as the fit between a person and her or his environment. A good fit between the person and environment usually results in low-stress levels, while a bad fit results in a higher stress level. In general, there is a distinction

made between distress, which is "a negative psychological response to a stressor" (Simmons, 2000, p. 42), and eustress, which is "a positive psychological response to a stressor" (Simmons, 2000, p. 42). Distress can be short- or long-term and often results in decreased performance or lower mental and physical wellbeing. In turn, eustress is often short-term and has beneficial effects on attention, energy, and performance (Ogden, 2017). What impact stress has is dependent on the mindset and personality of the individual but also how she or he is reacting to a particular situation, see Figure 2. The start of a new study is a major life event for many students and is a common problem for freshmen students, for instance, to live on their own or with strangers and experience a different lifestyle at university (Stroebe, Van Vliet, Hewstone, & Willis, 2002; Thurber & Walton, 2012).

Figure 2

The Transactional Model of Stress adopted from Lazarus and Folkman (1987)



Furthermore, the findings of how stress develops throughout the studies are quite inconsistent, with some research reporting a decline in distress while others did not (Adlaf et al., 2001). Research has also shown that stress has a negative impact on the mental health of university students (Ontario University & College Health Association [OUCHA], 2009). In the current study, perceived stress is seen as the negative or positive psychological response to a stressor (see Simmons, 2000) as it closely resembles the aim of mindfulness. The concept of mindfulness is part of the broader area of positive psychology, which will be explained in the following.

Positive psychology and mindfulness

Both the two-factor model and the construct of mindfulness are part of the broader area of positive psychology, which is defined as "the study of the conditions and processes that contribute to the flourishing or optimal functioning of people, groups, and institutions" (Gable & Haidt, 2005, p. 103). Research in the area of positive psychology has repeatedly shown that

concepts such as gratitude, mindfulness, meaning, positive social relationships, hope, optimism correspond with optimal mental health (Seligman, 2011). By practically integrating these concepts into positive psychology interventions (PPI), it was shown that these interventions have the potential to increase wellbeing and quality of life while also significantly decreasing depression, anxiety, and stress (Carr et al., 2020; Sin & Lyubomirsky, 2009).

According to Kabat-Zinn (2013, p. 11) mindfulness is defined as "the awareness that arises by paying attention on purpose, in the present moment, and non-judgmentally". Mindfulness centers on one's present experience in a purposeful, non-judgmental and non-reactive way and usually cultivates an attitude of acceptance (Kabat-Zinn, 2003; Baer, 2003; Bishop et al., 2004; Carmody, 2009). However, there are multiple interpretations and descriptions of mindfulness, with some research rather viewing mindfulness as an enduring trait or as a meditation practice, or as an intervention (Vago & Silbersweig, 2012). According to Garland, Farb, Golding and Fredrikson (2015, p. 295) "[…] a complete theory of mindfulness must account for the cultivation of positive mental states rather than focus exclusively on the reduction of negative states". Based on the previous information, it is thus important to investigate both levels of stress and wellbeing of university students for a comprehensive understanding.

Demographic differences in wellbeing and perceived stress

Kelders et al. (2019) have conducted a cross-sectional survey among University of Twente students and found significant differences in both perceived stress and wellbeing between Dutch and international students. Internationality has been repeatedly shown to influence perceived stress, with international students often reporting higher stress due to, for instance, being unfamiliar with the lifestyle and culture of the country where they are studying (Chen, 1999; Mori, 2000). Furthermore, it was found that female students experience significantly more stress and anxiety than male students (Kelders et al., 2019; Misra & McKean, 2000). One explanation for this effect might be that female students are more competitive and concerned about securing higher marks in exams than their male counterparts (see Saravanan & Wilks, 2014). Additionally, previous research has shown that LGBT students experience mental illness and more stress than non-LGBT students (Oswalt & Wyatt, 2011; Westefeld, Maples, Buford, & Taylor, 2001). These results were also confirmed by the research of Kelders et al. (2019), with LGBT students scoring worse on wellbeing and stress variables than non-LGBT students. One possible reason for these differences is that LGBT students were shown to encounter hostile climates more often than their non-LGBT peers (see Renn, 2020). Additionally, Kelders et al. (2019) also found out that students with reported illness or disability

scored significantly worse on wellbeing and stress variables than students that did not report any illness or disability.

Furthermore, several significant predictors of perceived stress and wellbeing were found to play a role, with intolerance of uncertainty, fear of missing out, loneliness, resilience, stress mindset, and sense of belonging significantly influencing the perceived stress level (Kelders et al., 2019). In turn, intolerance of uncertainty, loneliness, resilience, and a sense of belonging were found to significantly influence the wellbeing level of students. These predictor variables and their definitions will be shortly explained one by one in the following.

Predictors of perceived stress and wellbeing

Intolerance of uncertainty. According to Carleton, Norton, and Asmundson (2007, p. 106), intolerance of uncertainty is defined as "intolerance of the notion that negative events may occur and there is no definitive way of predicting such events". Intolerance of uncertainty was also shown to be linked to anxiety and depression (Butzer & Kuiper, 2006; Carleton et al., 2012). Kelders et al. (2019) explained that this might be because people with a high intolerance of uncertainty tend to feel threatened in many situations, which results in stress and anxiety. Support for this assumption was also found with a regression model of stress where high levels of uncertainty were shown to be connected to higher perceived stress and also to lower wellbeing (Kelders et al., 2019).

Fear of missing out. According to Przybylski, Murayama, DeHaan, and Gladwell (2013, p. 1841), fear of missing out is the "pervasive apprehension that other might be having rewarding experiences from which one is absent". According to Riordan et al. (2020), fear of missing out levels might be different today due to social media, where people get frequently reminded of what they are missing out on. Furthermore, it was also found that high levels of fear of missing out result in stress and poor sleep (Riordan et al., 2020). The assumption of Kelders et al. (2019), that higher levels of fear of missing out result in a lower wellbeing level, were not supported by their regression model. However, higher levels of fear of missing out did result in higher levels of perceived stress (Kelders et al., 2019).

Loneliness. According to Hughes, Waite, Hawkley, and Cacioppo (2004, p. 657), loneliness is not only the feeling of being alone but also involves "feelings of isolation, feelings of disconnectedness and feelings of not belonging". Previous studies have shown that loneliness is related to higher depression and stress and lower wellbeing (Cacioppo, Hughes, Waite, Hawkley, & Thisted, 2006; Shankar, Rafnsson, & Steptoe, 2015). Kelders et al. (2019) assumed that higher loneliness scores are related to lower wellbeing scores which they found support for

with their regression model. Additionally, it was found that higher loneliness scores are also related to lower wellbeing scores (Kelders et al., 2019).

Resilience. There are several slightly different definitions of resilience, for instance, Smith et al. (2008, p. 194) defines it as "the ability to bounce back or recover from stress, to adapt to stressful circumstances, to not become ill despite significant adversity and to function above the norm in spite of stress and adversity". In turn, Zautra, Hall and Murray (2010, p. 4) define resilience as "an outcome of successful adaptation to adversity". Another definition of resilience was provided by Dulin et al. (2018, p. 57), with "resilience resources as positive, psychological, behavioral, and/or social adaptation in the face of stressors and adversities". Even though the definitions are slightly different, all of them have in common that resilience has to do with successfully adapting to stress and adversity. In earlier studies, there was already a positive effect on wellbeing shown with students (Abolghasemi & Varaniyab, 2010; Dunn, Iglewicz & Moutier, 2008; Grant & Kinman, 2012). This was also supported by Kelders et al. (2019), where higher resilience scores resulted in higher wellbeing scores and also resulted in lower perceived stress scores. One explanation for that is that people with more resilience can adapt better and consequently handle stressful situations more easily.

Stress mindset. The stress mindset of a person is closely related to the concepts of distress and eustress, namely that stress can be viewed as negative and inhibiting or as beneficial and enhancing (Crum, Salovey, & Achor, 2013). In other words, it is the perception of stress having positive or negative consequences for, for instance, growth or performance. Previous studies have found that a positive stress mindset is related to higher wellbeing (Crum, Akinola, Martin, & Fath, 2017; Crum et al., 2013), most likely because stress is seen as enhancing rather than inhibiting. Additionally, Kelders et al. (2019) found out that a negative stress mindset is related to higher perceived stress levels.

Sense of belonging. According to Hagerty, Lynch-Sauer, Patusky, Bouwseman and Collier (1992, p.173), a sense of belonging is defined as "the experience of personal involvement in a system or environment so that persons feel themselves to be an integral part of that system or environment". Previous research has shown that first-year students often struggle with isolation, which is why a good sense of belonging is crucial for their success (Pearson, 2012). Hausmann, Schofield and Woods (2007) have shown that a low sense of belonging is related to dropping out of college. Additionally, this disconnection was exacerbated by financial pressures for the academic institutions, which eventually resulted in an extensive use of online learning material and larger class sizes (O'Brien, 2002). In other words, for good student retention, it is important to create a caring environment where

especially at-risk students "feel that they are cared for by the institution" (Heisserer & Parette, 2002, p.6). Kelders et al. (2019) found in their study support for the assumption that a higher score on sense of belonging is related to a higher wellbeing level and to a lower perceived stress level.

COVID-19 circumstances. The changing circumstances of the COVID-19 pandemic, including social distancing, online learning, and public health quarantine measures, were found to increase students' mental health problems and their inability to cope with the current situation (Wang et al., 2020; Husky, Kovess-Masfety, & Swendsen, 2020; Hamza, Ewing, Heath, & Goldstein, 2021). In the Netherlands, the outbreak of the COVID-19 situation contributed negatively to this, as was shown by an increase of anxiety and depression symptoms of Dutch students from 24.7% in 2019 to 29.7% in 2020 (EM, 2020). In contrast, the pandemic did not result in a significant increase of mental health problems of students in 2020, as reported by CBS (2021).

Interventions

Previous studies have confirmed the concerning rates of high stress and mental health problems among students and several attempts have been made at developing interventions to mitigate these problems (see Regehr et al., 2013). Regehr et al. (2013) have reviewed several types of stress interventions and showed that cognitive, behavioral and mindfulness-based interventions significantly reduced symptoms of anxiety. In line with the area of positive psychology and the two-factor model, interventions that involve mindfulness as a core usually focus on strengthening the resilience of a person and emphasizing personal growth rather than the removal of disorder (Schultchen et al., 2020). Furthermore, Garland et al. (2015) proposed the Mindfulness-To-Meaning theory, where they suggest that practicing mindfulness can help to enhance savoring due to self-reflective and metacognitive elements. In turn, savoring helps people to be aware of, generate and intensify enjoyment as well as appreciation (Bryant & Veroff, 2017; Frijda & Sundararajan, 2007).

Several existing mindfulness interventions have been shown to enhance psychological wellbeing and reduce psychological distress, often based on the principle of Mindfulness-Based Stress Reduction (MBSR; Frank, Reibel, Broderick, Cantrell, & Metz, 2015; Smith, 2014; Ștefan, Căpraru, & Szilágyi, 2018). MBSR involves different types of exercises, for instance, guiding and practicing mindful breathing, body scans or meditations. Studies have shown that MBSR can significantly reduce the distress of non-clinical participants such as university students (Regehr et al., 2013), but also of clinical participants such as cancer patients (Bränsträm, Kvillemo, Brandberg, & Moskowitz, 2010). Within an MBRS course, participants

learn to get more aware of their affective responses to external events in order to change their internal experience of stress (Klatt, Buckworth & Malarkey, 2009). In turn, this core activity of MBRS has been shown to improve coping skills (Rosenzweig, Reibel, Greeson, Brainard, & Hojat, 2003), improve subjective health and wellbeing (see Schultchen et al., 2020; Beddoe & Murphy, 2004), reduce stress and enhance forgiveness of students (Kang, Choi, & Ryu, 2009; Oman, Shapiro, Thoresen, Plante, & Flinders, 2008). While most of the MBSR interventions were conducted offline, Zollars, Poirier and Pailden (2019) investigated the effects of the mindfulness app Headspace and found similar positive effects of mindfulness on mental wellbeing and perceived stress in pharmacy students.

The original purpose of Mindfulness-Based Stress Reduction (MBSR) was to decrease stress, depression and anxiety, however, as mentioned above, this approach seems rather narrow or limited due to its' focus on the reduction of negative variables (Ivtzan et al., 2016). Thus, to successfully integrate positive psychology into a mindfulness intervention, not only the reduction of negative concepts such as stress but also the enhancement of positive concepts such as wellbeing have to be considered.

Online delivery and feasibility

Many universities already provide free counseling services. However, it was shown that a lot of university students do not reach out or use face-to-face interventions due to the fear of being stigmatized (Barrable et al., 2018). In the study of Downs and Eisenberg (2012), commonly reported barriers to seeking treatment by students were (1) preferring to deal with stress alone (73.3%), (2) believing that stress is part of university life and thus normal (52.2%), (3) not considering their needs as serious (52.1%) or (4) not having the time to get treatment (46.7%).

Since many university students and young adults make use of the Internet and also seek health information online (Chiauzzi, Brevard, Thurn, Decembrele & Lord, 2008; Hanauer, Dibble, Fortin, & Col, 2004), an online intervention might be most suitable as it helps to remove several barriers. Benefits of such online interventions include the constant availability and anonymity, the comfort of one's own personal space and location, as well as the accessibility with various devices (Barrable et al., 2018). Another argument for the usage of an online intervention is that there is a decrease in the counseling budgets of universities but an increase in the psychological problems of students (Kitzrow, 2003; Terneus, 2006). With an online intervention, students can receive an easily accessible and low-cost solution. However, the type of online intervention plays a crucial role here, since guided self-help interventions are more effective or almost as effective as face-to-face interventions than purely self-help interventions

(Gellatly et al., 2007; Johansson & Andersson, 2012; Newman, Szkodny, Llera, & Przeworski, 2011; Richards & Richardson, 2012; Spek et al., 2007; Cuijpers, Donker, van Straten, Li, & Andersson, 2010). Also, the adherence to guided self-help interventions is adequate or similar to face-to-face interventions (Van Ballegooijen et al., 2014). In turn, unguided Mindfulness-based self-help (MBSH) interventions, based on book-based or audio-based self-help interventions, were also shown to significantly reduce anxiety and depression.

For an online mindfulness course, additional challenges arrive in terms of the type of information delivery and establishing a group feeling since other participants are not physically present, which may influence the courses' effectiveness (see Krusche, Cyhlarova, King & Williams, 2012). Based on that, the current study will also investigate whether an online mindfulness course is a feasible way of teaching and disseminating mindfulness practices. To do so, the online mindfulness course will be evaluated in-depth in terms of guidance style, setting and content and what changes could be made for the implementation in the future to improve the feasibility.

Current study

As mentioned earlier, academic interest in mindfulness is increasing, however, there is still research missing that investigates the possibilities of mindfulness interventions in this particular context. The main purpose of the current study is to investigate the preliminary effectiveness and feasibility of a short, guided online wellbeing course for University of Twente students. The topics of this four weeklong online wellbeing course are based on central concepts in the area of positive psychology, such as mindfulness and gratitude. In terms of feasibility, the courses' current feasibility, as well as the implementation in the future, will be investigated. Regarding effectiveness, it will be explored if an online mindfulness-based intervention can help enhance UT students' wellbeing while at the same time decrease their perceived stress. In other words, wellbeing and perceived stress will be the primary outcomes of the study. It will also be investigated how and if the secondary outcomes, namely the predictor variables of perceived stress and wellbeing, will change over time. Two research questions will be investigated in this two-part research, namely (1) "How feasible and implementable is a guided online wellbeing course for UT students?" and (2) "What is the effectiveness of a guided online wellbeing course on UT students perceived stress and wellbeing?". Additionally, it will be explored whether the findings of the prediction models of Kelders et al. (2019) can be replicated and extended to a mediation model with mindfulness as a mediator.

Feasibility

As mentioned above, the online setting of the mindfulness course poses additional challenges for both the information delivery and the group feeling (see Krusche et al., 2012). In terms of online information delivery, participants' perception of the retrieved information will be explored (1) What are participants' impressions on the content of the online wellbeing course?. To get better insight into how participants perceive the online environment and the presence of others, the following will be explored: (2) What are participants' impressions on the set-up of the online wellbeing course?. Lastly, it will be explored what can be changed for a possible future online wellbeing course: (3) What are aspects that can be improved for a future online wellbeing course?

Effectiveness

Based on the previous findings on mindfulness interventions such as MBSR (see Zollars et al., 2019), the primary outcomes of wellbeing and perceived stress will be investigated with the following hypotheses:

1. Perceived stress levels will significantly decrease throughout the online wellbeing course
2. Wellbeing levels will significantly increase throughout the online wellbeing course

Since the primary outcomes, as well as the predictor variables of perceived stress and wellbeing (see Kelders et al., 2019), were used as a basis for the content and structure of the course, the following set of hypotheses was posed to investigate the secondary outcomes:

3. Resilience levels will significantly increase throughout the online wellbeing course
4. Sense of belonging levels will significantly increase throughout the online wellbeing course
5. Stress mindset levels will significantly increase throughout the online wellbeing course
6. Intolerance of uncertainty levels will significantly decrease throughout the online wellbeing course
7. Loneliness levels will significantly decrease throughout the online wellbeing course

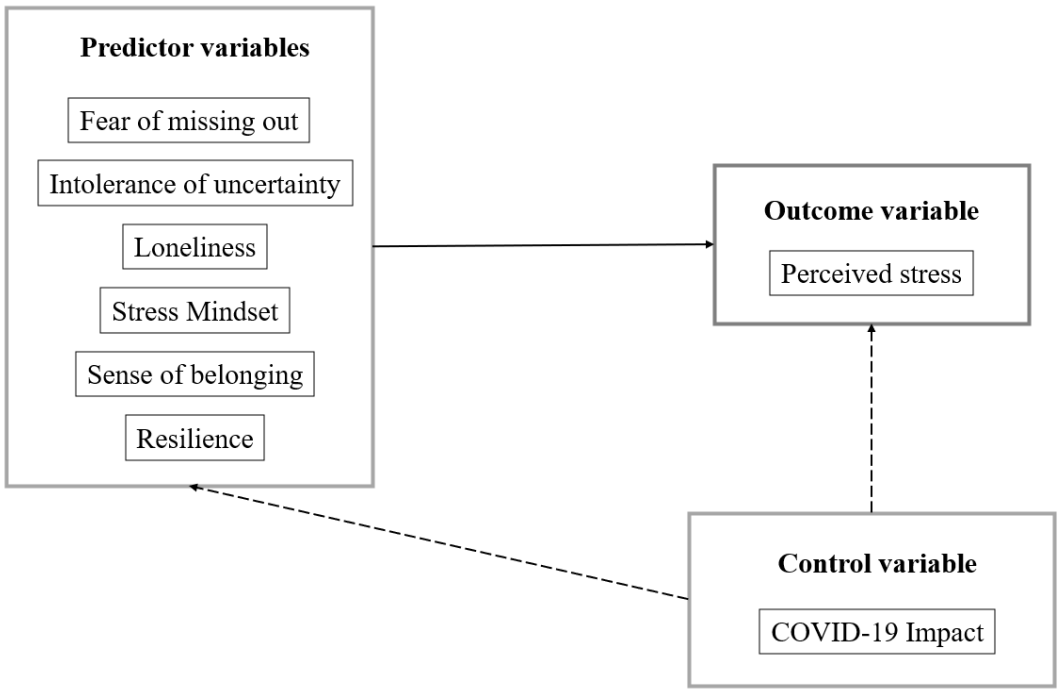
Prediction and mediation model

The current study will explore whether the depicted prediction models of perceived stress (see Figure 3) and wellbeing (see Figure 4) by Kelders et al. (2019) can be confirmed. Additionally, the impact of COVID-19 will be measured to test and control for any possible

confounding effects. To investigate the prediction models, the following hypotheses will be tested:

Figure 3

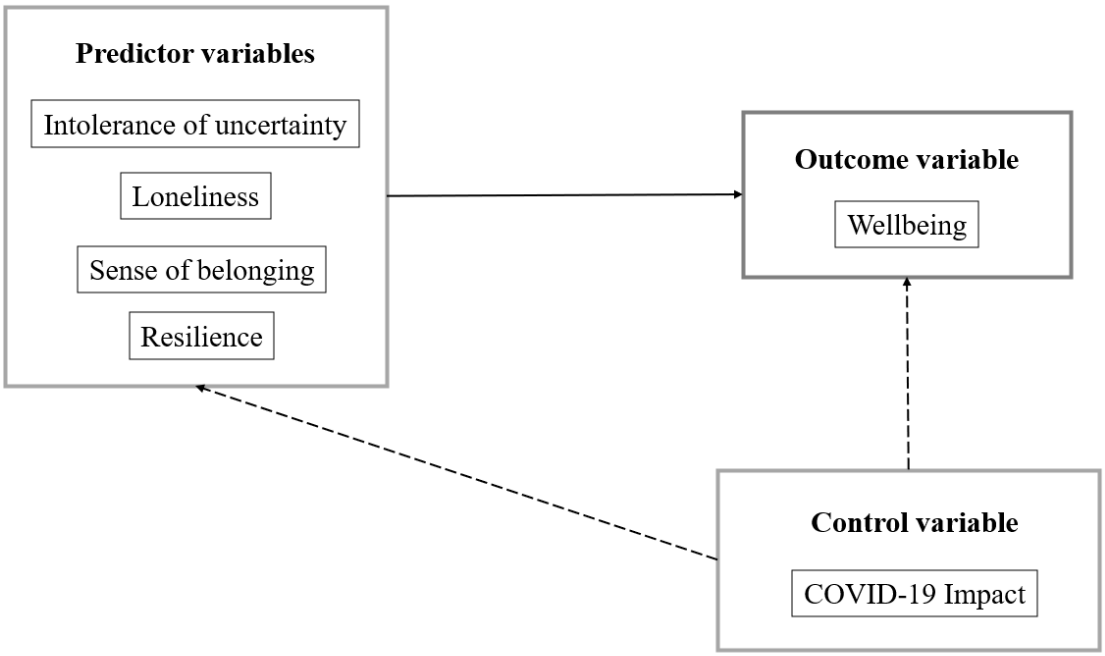
Prediction model of perceived stress by Kelders et al. (2019) with the addition of COVID-19



8. Resilience will be significantly negatively correlated with perceived stress
9. Intolerance of uncertainty will be significantly positively correlated with perceived stress
10. Fear of missing out will be significantly positively correlated with perceived stress
11. Loneliness will be significantly positively correlated with perceived stress
12. Stress mindset will be significantly negatively correlated with perceived stress
13. Sense of belonging will be significantly negatively correlated with perceived stress

Figure 4

Prediction model of wellbeing by Kelders et al. (2019) with the addition of COVID-19

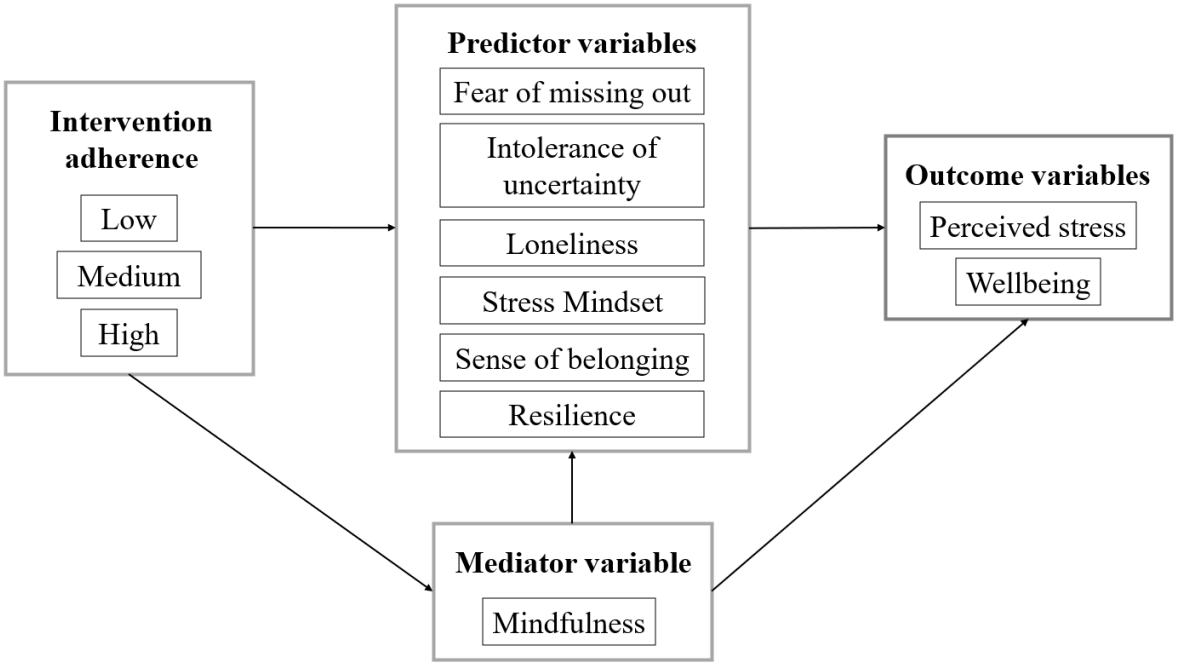


14. Resilience will be significantly positively correlated with wellbeing
15. Intolerance of uncertainty will be significantly negatively correlated with wellbeing
16. Loneliness will be significantly negatively correlated with wellbeing
17. Sense of belonging will be significantly positively correlated with wellbeing

Since the online wellbeing course is based on the concept of mindfulness, it is expected that mindfulness will have a mediating effect on the predictor variables, which in turn affect the outcome variables of perceived stress and wellbeing (see Figure 5). The direct effect or influence of mindfulness on wellbeing and perceived stress will also be tested for completion. For the mediation model, the following hypothesis will be tested:

Figure 5

Mediation model of stress and wellbeing with mindfulness as mediator and intervention adherence as the independent variable



18. Mindfulness levels will significantly increase throughout the online wellbeing course
19. Mindfulness will function as a mediator between the intervention adherence and predictor variables of perceived stress and wellbeing

Method

Overall study design

The study consisted of two sub-studies and used a combination of quantitative and qualitative methods. In the first part, participants had to fill in six surveys in total while participating in a four weeklong online wellbeing course. This part was tested with first-year Psychology students and then repeated with senior Psychology students at the University of Twente. The purpose of this first part was to investigate the effectiveness of the online wellbeing course with a mediation model of perceived stress and wellbeing. In the second part, a sub-group of both groups of participants was invited for a follow-up interview. The purpose of the second part was to investigate the feasibility of the online wellbeing course by getting insights into participants' experiences and opinions. The study was approved by the BMS Ethical Committee of the University of Twente, request number 210628.

Feasibility

Participants

In total, 11 interviews were held, 6 with first-year Psychology students and another 5 interviews with senior Psychology students that participated in the online wellbeing course beforehand. More specifically, 3 of the senior Psychology students were in their second year, 1 was in the third year and 1 was in the pre-master. The participants that indicated an interest in the interview via a question in the post-survey were recruited via their student email addresses. The age of participants ranged between 19 and 24 years, with a mean age of 21.09 years (*SD* = 1.76). Regarding gender, 8 (72.7%) were female, 2 (18.2%) were male and one participant identified as non-binary (9.1%). Furthermore, 6 (54.5%) participants had a German nationality, 3 (27.3%) had a Dutch nationality, 1 (9.1%) had a Luxembourgish and 1 (9.1%) had a Mexican nationality. Before participating in the interview, participants gave their oral consent to make a preliminary recording for transcription purposes.

Procedure and materials

The structured interviews lasted between 27 and 79 minutes. All interviews were held online via Microsoft Teams and were recorded for transcription purposes after participants gave their oral consent for it. The interviews followed an interview scheme (see Appendix A) to enable a proper comparison between the answers of the students. Before the actual interviews took place, a pilot interview was conducted and the first interview scheme was slightly adapted. At first, some background and person-related questions were asked to gather demographical data and data about previous experience with mindfulness and meditation. Then, several

questions regarding their expectations and the overall impression of the course were asked. In the third part of the interview, the researcher made use of screen sharing to show the participants once again an overview of the different weeks of the online wellbeing course (see Appendix B). While screen sharing, several questions regarding the opinion on and evaluation of the topics were asked. In the fourth part, questions about the implementation of the course in the future were asked. At the end of the interview, a few more closing questions were asked, including aspects such as willingness to participate in the future or recommending the course to others.

Analysis

Based on the recordings, verbatim transcripts of the interviews were created. A first coding scheme was created deductively based on the questions of the interview scheme and the overall categories were discussed with a second-rater before coding. Two coders independently coded the first interview and discussed their way of coding and choice of main codes. The main codes were added inductively to the deductive categories during the discussion. The rest of the interviews were coded by one coder based on the adjusted coding scheme and were discussed once again with the second coder.

Effectiveness

Participants

Ninety-seven bachelor and master students enrolled in the study program of Psychology at the University of Twente filled in the first online survey that was distributed via their student email address. Of the 97 participants, 79 participated in the intervention. Participants that filled in at least 4 out of the 6 surveys and that filled in the post-survey with demographical questions were included in the study. Since the minimum age for participation was set to 18, one participant had to be excluded. 13 participants were left out since they dropped out after filling in the first survey. Another 4 participants were excluded due to filling in the first survey twice. Furthermore, 30 participants only filled in parts of the surveys (less than 4) and did not fill in the post-survey, which resulted in missing demographical data, leaving 49 valid cases for the current study. Before participating in the surveys, participants needed to give their informed consent for participation (see Appendix C), in accordance with the ethical guidelines and procedures of the University of Twente.

Description of the sample. The age of participants ranged between 18 and 31 years, with a mean age of 21.27 years (SD = 2.44). In Table 1, an overview of the demographic variables of participants can be found. Furthermore, participants were also asked to indicate

whether different situations have occurred in the past year that might have had an impact on their ability to study (see Table 2).

Table 1

Frequencies of demographic and study related characteristics

Gender	**N (%)**
Male	10 (20.4%)
Female	38 (77.6%)
Non-binary/third gender/other	1 (2.0%)
LGBT	
Yes	14 (28.6%)
No	34 (69.4%)
Prefer not to disclose	1 (2.0%)
Religious belief	
Atheist/Agnostic/Non-religious	30 (61.2%)
Buddhism	1 (2.0%)
Christianity	10 (20.4%)
Spirituality	4 (8.2%)
Other	4 (8.2%)
Nationality	
German	33 (67.3%)
Dutch	9 (18.4%)
Other	7 (14.3%)
Year of study	
First year	39 (79.6%)
Second year	5 (10.2%)
Third year	4 (8.2%)
Pre-Master	1 (2.0%)

Table 2

Frequency for each situation that impacted the ability to study

Situation	**N (%)**
Illness	2 (4.1%)
Psychological problems	18 (36.7%)
Physical, sensory or other dysfunction	3 (6.0%)
Special family circumstances	6 (12.0%)
Board position FOBOS cat. 2 (e.g. study or sport organization)	1 (2.0%)
Board position FOBOS cat. 4 (Twente Teams)	1 (2.0%)
None of the above	28 (56.0%)

Design

The study was a single-group pilot study with six measurement points in time (see Table 3) to create a prediction and mediation model of perceived stress and wellbeing as well as to obtain longitudinal data on the various predictor, control, mediator, and outcome variables. Preliminary evidence of a prediction model of perceived stress and wellbeing with the current predictor variables was previously found by Kelders et al. (2019). The predictor variables were intolerance of uncertainty, loneliness, resilience, sense of belonging, fear of missing out and stress mindset. As a control variable, the COVID-19 student stress was measured during the pre-survey. The outcome variables were perceived stress and wellbeing, while the concept of mindfulness was treated as a mediator variable.

Within the pre-survey, the variables of mindfulness, fear of missing out, sense of belonging, resilience, stress mindset, fear of missing out, intolerance of uncertainty, COVID-19 Impact, as well as perceived stress and wellbeing, were measured. The survey about the first week involved feedback about the first week, such as the evaluation of the materials and attendance, and also measured wellbeing once again. During the feedback questions, participants were asked to rate the micro-lecture and live session of each week by assigning a grade that is in line with the Dutch grading system, ranging from 1 being very bad to 10 being very good. Additionally, participants were asked each week whether they completed the micro-lectures and attended the live session, which was used to determine adherence levels. In the survey about the second week, participants were asked for feedback about the second week and

the concepts of resilience, stress mindset, intolerance of uncertainty, and perceived stress scale were measured once again. The survey about the third week involved feedback questions about the third week and also measured the variables of fear of missing out, mindfulness, sense of belonging, and loneliness. The survey about the fourth week only involved feedback questions and the post-survey measured once again all variables.

Materials

Online wellbeing course. For the content of the online wellbeing course, the central concepts of the area of positive psychology were used. An overview of the structure per week can be found in Table 3. The online wellbeing course was offered via the online platform called 'Canvas', which is getting regularly used for publishing materials and accessing the courses of different study programs at the University of Twente. A small presentation of the wellbeing course was given to the group of first-year Psychology students and also an announcement was created on their course module on Canvas (see Appendix D). For the group of senior Psychology students (see Appendix E), the study advisor of Psychology provided a small explanation and official invitation to join the course, which was also used during the presentation. To have more diversity in the motivation to participate, first-year Psychology students were offered SONA credits for their participation, while senior Psychology students were only asked for voluntary participation. Students could either sign up via filling in the Qualtrics survey if they also wanted to participate in the study or could send an email to the researcher asking for enrolment without participating in the study. Each week, several pre-recorded videos were published, one including an introduction to the week's topic and the other one including instructions and guidance with the main exercises. Furthermore, additional external sources, impulses, and optional exercises were provided on the same week page. Four days after publishing the videos, an online live session was held via Zoom each week. An overview of the setup of the online wellbeing course can be found in Table 3. The topics and main exercises per week can be found in Table 4.

Table 3

Structure of the online wellbeing course and surveys per week

Week	Monday	Thursday
Week 0	Pre survey (Enrolment to course)	-
Week 1	Materials of the first week published	Live session first week
Week 2	Materials of the second week published Survey about the first week	Live session second week
Week 3	Materials of the third week published Survey about the second week	Live session third week
Week 4	Materials of the fourth week published Survey about the third week	Live session fourth week
Week 5	Survey about the fourth week Post survey	-

Table 4

Overview of the different topics and main exercises per week

Week	Topic	Main exercises
Week 1	What's my story?	Passion tracking 3-minute breathing space Gratitude
Week 2	Silence and compassions as a method	Body scan
Week 3	Where do I belong?	Metta-meditation
Week 4	What is my wellbeing?	Energy taking/giving

Survey. Before, during, and after the online wellbeing course, participants were asked to fill in several surveys that included, among other things, validated scales which will be presented in the following. To measure the perceived stress levels of students, the Perceived Stress Scale (PSS) was chosen (Cohen, Kamarck, & Memelstein, 1983). The PSS consists of 14 items that participants rated on a 5-point Likert scale ranging from 'Never' (0) to 'Very often' (4). Higher perceived stress levels are indicated by a higher total score on the PSS. Previous studies used the PSS in college student samples (Deckro et al., 2002; Örücü & Demir,

2009) and showed a good test-retest reliability for short periods of time (Lee, 2012). To measure the wellbeing levels, the Mental Health Continuum Short-Form (MHC-SF) by Keyes et al. (2008) was chosen which consists of 14 items. Each item was ranked on a 6-point Likert Scale ranging from 'Never' (0) to 'Every day' (5). A higher mean score on the MHC-SF indicates higher wellbeing. Similar to the PSS, the MHC-SF was used already more often in student samples (Amat et al., 2014) and showed a moderate test-retest reliability (Jenkins et al., 1988).

Going further, to measure the resilience levels of students, the Brief Resilience Scale (BRS) by Smith et al. (2008) was used. The SMM consists of 6 items with a 5-point Likert scale ranging from 'Strongly disagree' (1) to 'Strongly agree' (5). The higher the mean score is on the BRS, the more resilient a person is. In student samples, the BRS showed good psychometric qualities (Amat et al., 2014), and also the overall test-retest reliability was adequate (Rodríguez-Rey et al., 2016; Smith et al., 2008). For the measurement of students' stress mindsets, the Stress Mindset Measure (SMM) by Crum et al. (2013) was used. The SMM consists of 8 items that are ranked on a 5-point Likert scale ranging from 'Strongly disagree' (0) to 'Strongly agree' (4). Student samples were used for some parts of the SMM, making it adequate to use it here, and also the test-retest reliability was shown to be adequate (Crum et al., 2013). To measure the intolerance of uncertainty, the short version of the Intolerance of Uncertainty Scale (IUS) was used (Carleton et al., 2007), which consists of 12 items. Each item is ranked on a 5-point Likert scale, ranging from 'Not at all characteristic of me' (1) to 'Entirely characteristic of me' (5). The higher the sum of all answers is, the higher the resilience level of a person is. Similar to the SMM, the IUS was developed in student samples and showed a good test-retest reliability (Buhr & Dugas, 2002; Carleton et al., 2007). To measure fear of missing out, the fear of missing out (FoMO) scale of Riordan et al. (2020) was used, which consists of 1 item with a 5-point Likert scale ranging from 'Definitely yes' (1) to 'Definitely not' (5). A higher score here indicated a lower fear of missing out. Furthermore, there is a strong correlation between the single item and 10-item FoMO and a good test-retest reliability was shown (Riordan et al., 2020). To measure loneliness, the short scale for measuring loneliness was used (Hughes et al., 2004), consisting of 3 items with a 3-point Likert scale ranging from 'Hardly ever' (1) to 'Often' (3). Based on the 3 items a mean score was calculated, with higher scores indicating higher loneliness. Again, the scale was developed with college students and showed a good test-retest reliability (Cacioppo et al., 2006; Hughes et al., 2004). To measure the sense of belonging, the sense of belonging subscale of the perceived cohesions scale by Bollen and Hoyle (1990) was used. The sense of belonging subscale consists of 3 items that are ranked on an 11-point Likert scale ranging from 'Strongly disagree' (0) to 'Neutral' (5) to 'Strongly agree' (10). Based on

the 3 items, a mean score was calculated, with higher scores indicating a higher sense of belonging. The sense of belonging scale was developed for college students (Bollen & Hoyle, 1990), however, there is no information about the test-retest reliability.

To measure mindfulness, the short form of the mindful attention awareness scale (MAAS) by Brown and Ryan (2003) was used. The MAAS-SF consists of 5 items that are ranked on a 6-point Likert scale ranging from 'Almost always' (1) to 'Almost never' (6). Here, higher scores indicate a higher mindfulness level, and a good test-retest reliability was shown (Black, Sussman, Johnson & Milam, 2012). Lastly, to measure the current COVID-19 situation of the students, the COVID-19 Student Stress Questionnaire (CSSQ) by Zurlo, Cattaneo Della Volta, and Vallone (2020) was used. The CSSQ consists of 7 items that are ranked on a 5-point Likert scale ranging from 'Not at all stressful' (0) to 'Extremely stressful' (4). Here, higher scores indicate a higher COVID-19 stress level. Up until now, no information is available on the test-retest reliability. The Cronbach's alpha for each scale in the current study was calculated and compared with the one of the original studies (see Table 5).

Table 5

Comparison of the used scales and the Cronbach's alpha of each scale

Scale	Reference	Cronbach's alpha in the original study	Cronbach's alpha in the current study
Perceived Stress Scale (PSS)	Cohen, Kamarck and Memelstein (1983)	.84 - .86	Week 0: .91 Week 2: .87 Week 5: .89
Mental Health Continuum Short-Form (MHC-SF)	Keyes et al. (2008)	.89 Subscales: .83, .74, .83	Week 0: .94 Week 1: .94 Week 5: .93
Brief Resilience Scale (BRS)	Smith et al. (2008)	.80 - .91	Week 0: .83 Week 2: .78 Week 5: .83
Stress Mindset Measure (SMM)	Crum et al. (2013)	.86	Week 0: .80 Week 2: .71 Week 5: .80

Short version of Intolerance of Uncertainty Scale (IUS)	Carleton et al. (2007)	.89	Week 0: .92 Week 2: .92 Week 5: .92
Fear of Missing Out (FoMO) Scale	Riordan et al. (2020)	-	-
Short scale for measuring Loneliness	Hughes et al. (2004)	.72	Week 0: .83 Week 3: .67 Week 5: .78
Sense of Belonging of perceived cohesion scale	Bollen and Hoyle (1990)	.89 - .95	Week 0: .92 Week 3: .92 Week 5: .95
Mindful Attention Awareness Scale (MAAS) Short Form	Brown and Ryan (2003)	.89 -. 93 (Black, Sussman, Johnson & Milam, 2012)	Week 0: .88 Week 3: .90 Week 5: .93
COVID-19 Student Stress Questionnaire (CSSQ)	Zurlo, Cattaneo Della Volta and Vallone (2020)	.71	Week 0: .77

Procedure

Before sending out the survey, a quick pilot test was conducted with three participants to check for spelling mistakes and understandability. The survey was distributed via Canvas announcements for first-year Psychology students (see Appendix D) and distributed by email to senior Psychology students at the University of Twente (see Appendix E). After filling in the pre-survey, participants got invited by the researcher to the online environment of the online wellbeing course. Participants filled in their email addresses which were preliminary used for reinviting participants for follow-up surveys and to interconnect their data of the different surveys. After filling the post-survey, the email addresses were removed both from the email list and dataset.

The materials of the different weeks involved pre-recorded lectures with two professionals from the area of positive psychology and additional materials such as exercises and external links. Each week, a live session was held via Zoom with the participants and one of the two professionals intended for sharing experiences and opinions as well as for practicing guided mindfulness and meditation more in-depth.

Data analysis

The survey data were analyzed with IBM SPSS Statistics 27 and a significance level of 0.05 was chosen. First, the data were checked for normality, missing values and negatively formulated items were recoded to conduct valid analyses. First, the two outcome variables, namely perceived stress and wellbeing were inspected to see whether they deviate from a normal distribution with the help of QQ and stem and leaf plots. Possible outliers were evaluated on whether they deviated more than four standard deviations from the mean and whether their presence or absence would induce a large change in the overall results.

Then, descriptive statistics for the predictor variables, control variable, outcome variables and mediator variable were calculated. Next, a repeated measures ANOVA was conducted to test the first seven hypotheses. To test the remaining hypotheses, correlation analyses by means of Pearson correlations were conducted. Additionally, multiple regression analyses were run to test whether the prediction model of perceived stress and wellbeing can be confirmed. For the very last hypothesis, adherence levels were determined based on the completion of micro-lectures and live sessions. Two groups were created with the quartile function in SPSS to create almost equal groups for the completion of micro-lectures (low versus high) and the attendance of live sessions (low versus high). Based on these categories, another variable was created for the total adherence level, which resulted in three equal groups with the quartile function (low versus medium versus high). Participants that were low in micro-lecture completion and high in live session attendance were falling into the category of medium. Then, the change scores were calculated for mindfulness and the predictor variables by subtracting the post-survey score from the pre-survey score. Subsequent mediation analyses were conducted by first testing the direct effect of adherence levels on the predictor variables with a multiple regression analysis. Afterward, the mediator variable mindfulness was included in a multiple regression analysis to test whether the relationship was mediated by mindfulness. If the direct effect of the adherence level on the predictor variables became nonsignificant or significantly reduced, it was concluded that the relationship was mediated by mindfulness (see Baron & Kenny, 1986). Then, the same steps were repeated for adherence levels, mindfulness and the outcome variables of perceived stress and wellbeing. Again, if the direct effect of the

adherence level on the outcome variables became nonsignificant or significantly reduced, it was concluded that the relationship was mediated by mindfulness.

Results

Feasibility

The sub-codes were created deductively based on the coding scheme and the main codes were created inductively after coding and discussing the first interviews (see Appendix F).

Participant characteristics

Reason to participate. Eight of the eleven students mentioned that the main reason to participate in the course was their general interest in mindfulness and positive psychology and that they would like to gain more knowledge about it. Other reasons for participation were taking better care of oneself and not feeling well (n = 5), collecting SONA points necessary to complete their studies (n = 2) or helping out the researcher with the study (n = 1). One participant mentioned multiple reasons for participation:

> *"I was kind of interested more in like mindfulness and also like positive psychology more in general as like that and I thought well if you can do something for your own mental health why not do it? So yeah it was kind of a both those things and then I was like well you can do something for your mental health and get SONA points as well. So it is like, it was like triple you gain knowledge you do something for yourself and you benefit as well on it. […]"* [Participant 1, first-year]

Experience. In terms of previous experience, eight students mentioned that they were already familiar with some of the exercises or meditation in general since they tried it out beforehand with the help of courses or videos. Additionally, two students also mentioned that they were familiar with the concepts due to yoga sessions and another two mentioned that they tried it but stopped shortly afterward. Lastly, six students mentioned that they made use of mindfulness and meditation as a way of coping with panic attacks, asthma, sleep problems or stress (n = 6). One interviewee used it as a way of coping during tests:

> *"A little bit, I had developed my own way of resetting my mind and myself if my mind was very full. I usually used it in the middle of a test because at some point my head just would be full and I would breathe every question like 3 times. [...] If I still know it was there, then I would just close my eyes and sit upright and listen to every sound and go with my attention within my body and then gather energy again and if I do that for a*

few minutes and open my eyes again afterwards I would be able to read the questions again." [Participant 2, first-year]

Impressions of the course

General. Overall, all participants had a very positive impression of the course and described it as interesting, inspiring, helpful and fitting (n = 11). This impression also got confirmed by a participant during the survey:

"Thank you really much for this course. I am much more connected with my body and I am able to detach from my thoughts. I oftenly use my breath to reduce tension and remind myself to be conscious and avoid running on automatic pilot. I am thankful that you provided this course." [Participant quote from survey]

Some also described the course as well organized and structured (n = 4) and liked that the course provided social interaction possibilities (n = 3). Furthermore, eight students mentioned that the first week of the course provided a good introduction and opener to the course and brought them into the mindset. Seven students also mentioned that they liked the last week of the course since it provided a good summary and also helped to integrate it into daily life. In turn, the fourth week was also seen as a bit confusing since there was no new content introduced (n = 2). The topics and content of the weeks were also seen as simple, accessible, very applicable and suitable for daily life (n = 6). In Table 6 the assigned grades for each week and an overall grade can be found per participant.

Table 6

Assigned grades and overall grade per participant for each week

Participant	1. Week	2. Week	3. Week	4. Week	Overall
1	8.5/9	9.5	8	8.5	9.2
2	8	6.5	7.5	6.5	7
3	7	10	9	9	9
4	8	7	6/7	8	7
5	9	10	8/9	9/10	9
6	8	9	9	9	8
7	9	8	7/8	7/8	8
8	8	7	6	-	7.5/8
9	7.5	6	8/8.5	7.5/8	9
10	8/9	5	8	7	9

11	9	9	8	5/6	8
Average	8.31	7.25	7.8	7.75	8.23

Structure. Overall, most participants liked the order of the weeks and experienced them as gradually building upon each other (n = 8):

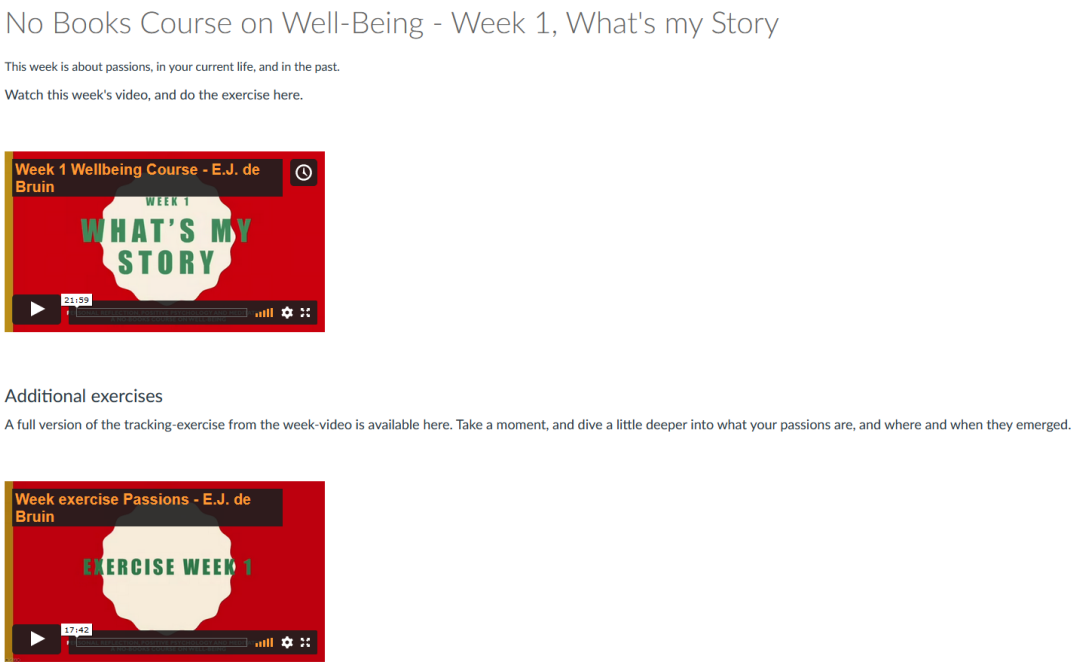
> *"I think when I think about it now, it definitely made sense the order I think it would have been weird for example to have the third topic in the beginning because you need some, I think you need to practice a little bit, you need to learn how to look at yourself and you cannot just start like this huge chunk of mindfulness. [...] So yeah it feels like a funnel a little bit, starting a little bit broader and familiarizing yourself, how it works the mechanisms and then go more into depth."* [Participant 11, second-year]

Two of the participants also liked the week to week format. However, two participants mentioned that they sometimes missed the connection between the different topics or felt that some weeks could maybe be switched. Three participants also mentioned that they liked the scheduling of weekly materials and live sessions since it gave the course some more structure. One participant also liked that the whole course was of course optional and that one does not feel left out if missing parts of the lecture or materials.

Design. Regarding the design, the formatting and structure of the course were seen as good and easy to find with an appropriate number of pages (n = 5). Also, the content and the balance between text, pictures and videos were seen as good (n = 4). However, four participants also mentioned that the design sometimes felt a bit empty and not very visually appealing and another two participants were questioning whether the color red is a good choice for a wellbeing course (see Figure 6).

Figure 6

Screenshot of the videos and main exercises of the first week on Canvas

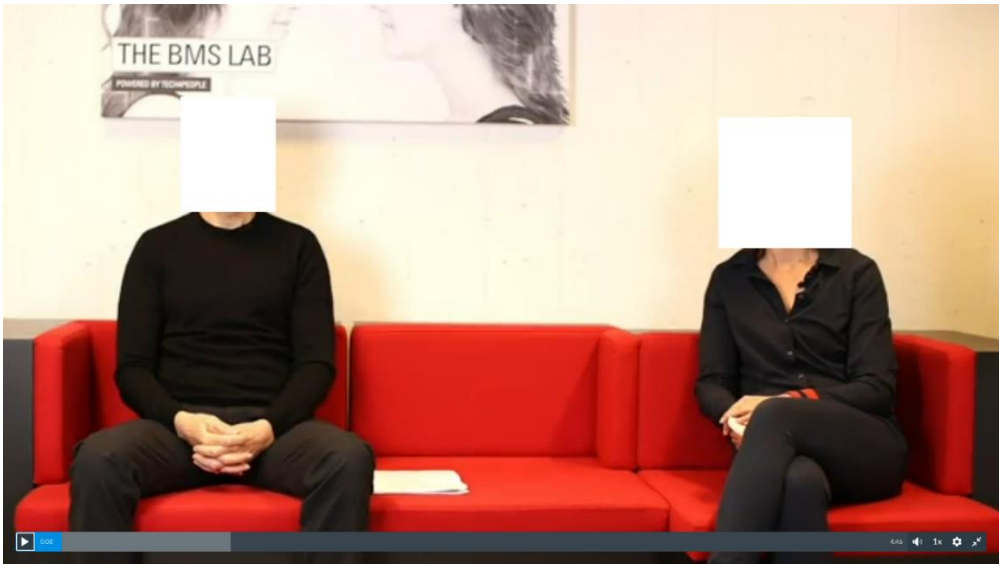


Also, three participants mentioned that the room where the videos were recorded felt a bit too minimalistic (see Figure 7):

> *"I feel like the room in which the instructors sat when they explained that was a bit, there was also a minimalistic look, it looked a bit as if it was somewhere in a public building like in a waiting area."* [Participant 4, first-year]

Figure 7

Screenshot of the pre-recorded lecture (anonymized)



The exercise being separated from the video was seen as useful (*n* = 1) but also confusing (*n* = 1) because it did not seem to be clear what is meant with additional exercises (see Appendix B). Another two participants mentioned a similar aspect, namely that the term of additional exercises was confusing since it included both the exercises of the video as well as the additional materials.

Ease of use. Almost all participants agreed that the course was very user-friendly, straightforward and easily accessible (*n* = 10):

> *"It was very simple, it was quite simple to use. It was pretty straightforward you know this day you do this and the live session would be on this day. So that was pretty nice because it did not feel like I had to find the email about the live session, about the announcement. It was all in one place. [...] So that was I would say pretty user-friendly. Yeah, I highly doubt it was hard to do that."* [Participant 3, first-year]

Additionally, five participants mentioned that the familiarity with the platform Canvas makes it easy to use. Two participants mentioned that they had trouble with finding one feature (marking exercises as complete) on the website.

Medium. All participants mentioned that the choice of Canvas as a medium was good because of the other courses students have on that platform (*n* = 11). Most of the participants explained that the platform choice was very useful due to the familiarity and existing access (*n* = 10). This was also pointed out by four participants, namely that there was no need to create a new account or to go to a different website for the course. Another five participants liked that it feels like a part of the university and study (*n* = 5).

In Table 7, the assigned grades for the design (layout and aesthetics) and for the ease of use per participant can be found. The averages are in line with what participants mentioned in the interviews since the design received more criticism from participants than the ease of use.

Table 7

Assigned grades for ease of use and layout and aesthetics per participant

Participant	Grade layout and aesthetics	Grade ease of use
1	8.5/9	9.5
2	7.5	8.5
3	7/7.5	10
4	6	8
5	7	10
6	6	7

7	6/7	8/9
8	6.5	8
9	7	8
10	8	10
11	6/7	9
Average	7.07	8.75

Micro-lectures. Overall, four participants mentioned that the micro-lectures felt quite long from time to time and that the sound quality was sometimes quite poor. However, one participant also mentioned that it was good to have the micro-lectures always published on one certain day to get more of a habit of it.

In Table 8 the self-indicated completion of micro-lectures per week can be found. The rate of completion decreased rapidly from week 1 to week 3 and then increased again for the last week of the course. An overview of the means and standard deviations of the grading per week can be found in Table 9.

Table 8

Self-indicated completion rates of the micro-lectures per week

		Participation (n)	
Micro-lectures	Yes	Partly	No
Week 1	35 (71.4%)	6 (12.2%)	8 (16.3%)
Week 2	28 (57.1%)	7 (14.3%)	14 (28.6%)
Week 3	25 (51.0%)	12 (24.5%)	12 (24.5%)
Week 4	30 (61.2%)	7 (14.3%)	12 (24.5%)

Table 9

Grading of the micro-lectures per week

	n	*M*	*SD*
Lecture week 1	39	7.46	1.43
Lecture week 2	35	7.37	1.19
Lecture week 3	35	7.17	1.52
Lecture week 4	36	7.53	1.18

Live sessions. Overall, the live sessions were described as very positive due to the exchange and discussion with other students as well as providing a sense of community (*n* = 8), which was also confirmed by one participant in the survey:

> *"I like the interactive part a lot! I always like participating in the live sessions too, it really has a nice atmosphere."* [Participant quote from survey]

Also, the scheduling of the live sessions was seen as very motivating and as something to look forward to during the week (*n* = 5). The online live sessions were at first experienced as strange due to the online setting (*n* = 3), but it became a very nice experience over time. Additionally, participants also mentioned that the live sessions were very insightful (*n* = 3) and that they disliked the low attendance rate during some sessions (*n* = 3).

In Table 10 the self-indicated attendance of all survey participants in terms of live sessions per week can be found. Once again, a strong decrease in attendance throughout the first three weeks is visible and a slight increase for the last live session. An overview of the means and standard deviations of the grading per week can be found in Table 11.

Table 10

Self-indicated attendance of live sessions per week

		Participation (n)	
Live sessions	Yes	Partly	No
Week 1	23 (46.9%)	2 (4.1%)	24 (49.0%)
Week 2	16 (32.7%)	2 (4.1%)	31 (63.3%)
Week 3	8 (16.3%)	4 (8.2%)	37 (75.5%)
Week 4	10 (20.4%)	5 (10.2%)	34 (69.4%)

Table 11

Grading of the live sessions per week

	n	*M*	*SD*
Live session week 1	24	8.08	1.64
Live session week 2	19	7.32	1.95
Live session week 3	11	7.82	0.98
Live session week 4	14	7.71	1.27

Teachers. Almost all participants were very positive about the two teachers that were guiding the course and described them as interested, helping, supportive, welcoming and calming (*n* = 10). One participant from the survey also confirmed this positive impression:

> *"I really like the teachers who do the live sessions they are very calm and friendly. It's always fun to join and listen to them".* [Participant quote from survey]

Additionally, many participants mentioned that they liked that the teachers were open to what students wanted to share, that they integrated everyone and that they gave the opportunity to reach out at any time (*n* = 9). Another five participants mentioned that they liked the responses to questions and advice from the teachers. Furthermore, it was mentioned that the guidance both during the videos and live sessions was good and that it gave the impression that the teachers are at the same level (*n* = 8). Four participants mentioned that they liked the mixture of the two teachers because of their different teaching styles.

(Additional) exercises. One participant indicated that he liked the choice of exercises and additional materials and the underlying connection of both:

> *"I think they were pretty nice, they were all similar in some way because they were all like similar exercises but they all had a different focus and it was indeed nice to experience all different kinds of things. [...] They were all still having the same core."* [Participant 2, first-year]

Regarding the main exercises, participants mentioned that the passion tracking exercise was very insightful and enjoyable for them (*n* = 7) and reminded them to pursue their passions more (*n* = 6). One participant did not feel the need to do that exercise and skipped it. Furthermore, participants described the 3-minute breathing space as interesting (*n* = 2), useful (*n* = 4) as well as a good reminder for those who were already familiar with the exercise (*n* = 4). One participant complimented the instructions and explanations given for that exercise and another participant mentioned that it was a good exercise for the introduction into the course. Three participants mentioned that they skipped the gratitude exercise, another 2 mentioned that they enjoyed the exercise. Regarding the body scan, some participants mentioned that it helped them to feel more connected with their body (*n* = 4) and described it as a nice experience (*n* = 5). Two participants were already familiar with the body scan. In turn, three participants found the body scan quite difficult because they are not used to listening to their body and one participant mentioned a preference for a quicker version of the body scan. The experience with the metta-mediation was quite mixed, with some participants seeing it as something new and interesting (*n* = 5) while others had some troubles with executing it (*n* = 2) or could not make sense of the exercise (*n* = 2). Lastly, the energy taking and energy-giving exercise was insightful

for almost half of the participants (*n* = 5). Three participants mentioned that they were working on improving their balance after the exercise and two participants mentioned that they did not consider the exercise as helpful. In Table 12, the assigned grades of each exercise can be found.

Table 12

Grading of the different exercises

	n	*M*	*SD*
Passion tracking exercise	38	7.24	1.76
3-minute breathing space	40	8.25	1.89
Gratitude exercise	35	7.83	1.47
Body scan	37	7.14	2.08
Metta-meditation	35	6.94	2.13
Energy taking/giving exercise	33	7.61	1.35

Regarding the additional exercises, more than half of the participants had a look at them (*n* = 7) and also did exercises that fit their interests:

"Yes, I always I read through them all the weeks and I also tried to do some of them. [...] I think the additional exercises were even more more of value because they always were a bit more, yeah you had to think a bit more about yourself and your experiences and so on so I think those were yeah quite good." [Participant 4, first-year]

However, the opinions on each additional exercise varied a lot between participants which indicates that the likeability and usefulness of the additional exercises depend on the personal preference of the individual.

Practicing of exercises. In Table 13, the number of times that participants practiced each exercise within a week can be found. The 'Not applicable' option was offered for participants who skipped the video of an exercise to have a clear distinction between participants completing the videos but not practicing the exercise and participants not watching the videos.

Table 13

Self-indicated number of times that each exercise was practiced

	Never	Once	Twice	Three Times	Almost every day	Every day	Not applicable
Passion tracking exercise	12 (24.5%)	14 (28.6%)	8 (16.3%)	3 (6.1%)	3 (6.1%)	0 (0%)	9 (18.4%)
3-minute breathing space	7 (14.3%)	8 (16.3%)	11 (22.4%)	8 (16.3%)	7 (14.3%)	1 (2.0%)	7 (14.3%)
Gratitude exercise	6 (12.2%)	13 (26.5%)	10 (20.4%)	5 (10.2%)	3 (6.1%)	0 (0%)	12 (24.5%)
Body scan	8 (16.3%)	10 (20.4%)	11 (22.4%)	6 (12.2%)	4 (8.2%)	0 (0%)	10 (20.4%)
Metta-meditation	13 (26.5%)	13 (26.5%)	9 (18.4%)	1 (2.0%)	0 (0%)	0 (0%)	13 (26.5%)
Energy taking/giving exercise	13 (26.5%)	17 (34.7%)	4 (8.2%)	3 (6.1%)	1 (2.0%)	0 (0%)	11 (22.4%)

Course in the future

Setting. Participants mentioned that the online setting should be integrated in the future as well because it was convenient regarding the location (n = 2) and it gave the possibility of anonymously joining the live sessions (n = 4). Also, the accessibility of the online exercises and materials was seen as an advantage (n = 5). Two people suggested that one online meeting per week should be offered for the people that are not on campus. Going further, most of the participants mentioned that they would prefer a mixture of offline and online settings (n = 9):

> *"I think it would be good to have a mix of both, I think it is nice to have the online material and online lectures to be able to access them anytime. [...] And there is also, I bet there is some value in you know having a session together and in person, I bet it is a whole different atmosphere. [...] So I am sure that would be really enjoyable, but I think the mix would be the best at least for me, because then I would get like the best of*

both like you know the accessibility but also the option to be there and yeah experience that different environment so both." [Participant 3, first-year]

Possible advantages of the offline setting were the possibility of meeting people (n = 6) and experiencing a different atmosphere (n = 10). However, for the latter part, it was mentioned that it depends on the group size and place. Four participants mentioned that they would like to have the course offered once or twice a year and two participants mentioned that it should be offered more often. It was mentioned that four weeks were a good start but that the course should be preferably more open-ended for the people that want to continue (n = 4).

Guidance. Overall, most participants indicated a preference for a course with guidance (n = 9):

"I think that guidance is definitely necessary for this, just so that you have someone who is experienced to like answer your questions and well maybe help you if you are, if you do not understand anything. So yeah, that is definitely very helpful. I feel like it is also hard to imagine this course without the guidance so." [Participant 5, first-year]

Participants indicated that the guidance of the teachers was very caring and motivating (n = 7). Additionally, one participant mentioned that a course without guidance is only possible for more experienced people.

Participation. Regarding future participation, all participants indicated that they would participate in this or a similar course in the future and that they think that people in their environment would participate in such a course in the future as well:

"I do think so like I said just totally random I ended up like having some of my good university friends without even knowing also participating in the course. [...] So that was like a fun yeah just coincidence. [...] But I do think that there would be some other people who would be interested in the course who might not have realized that it was going on or something like that so I do believe that yeah definitely." [Participant 1, first-year]

Additionally, all participants mentioned that they would also recommend this course to other people.

Personal experiences

Amount of time. All participants indicated that the amount of time that one spent on the course was appropriate:

"Completely doable like it was I need I mean most of the lectures were with around half an hour and then I could cut that down into a half basically almost by increasing the speed. The longest part was really like the most longest actual part were the live sessions

and that was also just like an hour so easily done and especially if you are talking or listening so that. [...] It was not really an issue I think it was, the time was fine." [Participant 10, third-year]

Two participants indicated that they expected a higher workload in terms of time in the beginning and were positively surprised by the actual amount of time. Six participants explained that they liked that it was up to themselves when and how much time they wanted to invest into the course. Both micro-lectures (n = 3) and exercises (n = 4) were experienced as appropriate in terms of time.

Added value. More than half of the participants indicated that the content and exercises were of added value since they helped to stay in the present moment and integrate it into daily life (n = 6). Participants also mentioned that they felt more connected with their body (n = 2), learned more about themselves (n = 2), learned from the exchange with other people (n = 2) and liked to have a toolbox of exercises for the future (n = 2):

"I mean one thing I can add is just in general that it was a really good experience for myself and I did learn a lot about myself and like what I need as in to further like improve my selfcare in a way. [...] So that was really a nice experience sometimes I would be like I knew that I needed something but I would not know what exactly like to use and how to like improve my like help myself so. [...] Having those like I said toolbox exercises now I am really happy for because now I can like I have more methods in a way to like improve selfcare and not just to like selfcare that is like oh I drink 2 liters of water and then all my problems are gone." [Participant 1, first-year]

Other

Expectations. Against initial expectations, most of the participants were positively surprised by the online wellbeing course (n = 8) since some expected a more academic and theoretical course (n = 4). Furthermore, three participants did not have a lot or no expectations ahead:

"I did not have that many expectations, but I think that is something that I did not expect like doing exercises during the lectures. [...] And yeah I thought it would be more like theoretical in a way, I did not think it would be so practical like with very you know straightforward things to do, exercises to do." [Participant 3, first-year]

Concerns. Participants mentioned several concerns that they had ahead of the course, including the effectiveness of the course (n = 1), the online meditation and interaction with new people (n = 2) and that it would be maybe too time-consuming or distracting (n = 4):

> *"I thought maybe it would be time-consuming or just like time-wasting, but in the end it was not."* [Participant 4, first-year]

Improvements. Regarding the **micro-lectures**, a slightly different setting for the recording and live sessions should be chosen. For instance, the recording can be made somewhere in nature and the live sessions held in a meditation room. Additionally, the sound quality and camera angle of the **micro-lectures** should be improved and also the option of subtitles should be considered. Another possibility would be to also provide the audio files of the micro-lectures since videos are not always necessarily needed during the exercise itself. Further minor improvements are that more in-depth guidance during the **exercises** should be given, for instance, about the breathing space or that some alpha wave background music could be added as it might have an additional calming effect. Next to the videos, more files should be provided in **general**, including the PowerPoint sheets, instruction sheets for the exercises or summaries like a list of all exercises.

Regarding the **structure** of exercises, different terms should be used for describing the exercises in the videos and the additional materials, for instance, by calling them main exercises and additional or optional exercises. The main exercises should also be in a separate video from the micro-lecture itself, as it both shortens the length of the videos and makes them more distinctive and clear. Furthermore, the number of exercises should be distributed more equally across the different weeks to create a better **structure** and to avoid an overload in one week while having too little in the other week. Additionally, more video materials similar to the micro-lectures should be provided for the additional exercises, which makes it easier, in turn, to also share the experience with the **additional exercises** during the live sessions. Furthermore, different strategies should be tested to increase the attendance of the **live sessions** since the attendance was quite low throughout the weeks. One possibility would be to send out Google Calendar invitations so that participants have them directly in their agenda. Regarding the **design**, the distinction between main exercises and additional materials should be made visually more clear, which could be done by larger headings and creating separate pages to avoid a lot of scrolling. Furthermore, a different color for the layout should be chosen, for instance, blue, since red is not a very calming color in itself.

Survey/effectiveness

Outcome variables

The data on perceived stress and wellbeing approached a normal distribution and neither presence nor absence of outliers that deviated more than four standard deviations induced a significant change.

Perceived stress

Hypothesis 1. Regarding perceived stress levels, a significant main effect of time was found [$F(1.662, 79.7790) = 11.792$, $p = .000$], with a large effect size (*partial* $\eta^2 = .20$). Perceived stress was measured with the PSS with a mean score of 30.53 ($SD = 9.54$) before the course, which is slightly higher than the mean value of 27.28 in Kelders et al. (2019). PSS scores decreased to 27.55 ($SD = 7.83$) during the course and to 26.14 ($SD = 8.35$) after the course. Furthermore, a significant negative correlation between perceived stress and wellbeing before the course was found ($r = -.66$, $p = .000$). The correlation between perceived stress and wellbeing stayed significant during the course ($r = -.61$, $p = .000$) and after the course ($r = -.53$, $p = .000$).

Wellbeing

Hypothesis 2. Regarding wellbeing levels, a significant main effect of time was found [$F(1.956, 93.882) = 3.315$, $p = .041$], with a medium effect size (*partial* $\eta^2 = .07$). Wellbeing was measured with the MHC-SF with a mean score of 2.54 ($SD = 1.05$) before the course, which is slightly lower than the mean value of 2.92 in Kelders et al. (2019). Wellbeing scores improved to 2.72 ($SD = 0.96$) during the course and to 2.76 ($SD = 0.97$) after the course. A more detailed overview of the means of the sub-scales can be found in Appendix G.

Predictor variables (Hypothesis 3-7)

Hypothesis 3-7. An overview of the means and standard deviations of the different predictor variables throughout the weeks can be found in Table 14. A significant positive main effect of time was found for resilience [$F(1.978, 94.938) = 14.696$, $p = .000$], with a large effect size (*partial* $\eta^2 = .23$), indicating a significant increase over time. A significant negative main effect of time was found for intolerance of uncertainty [$F(1.893, 90.857) = 3.259$, $p = .046$], with a medium effect size (*partial* $\eta^2 = .06$), indicating a significant decrease over time. Another significant negative main effect of time was also found for loneliness [$F(1.876, 90.063) = 8.425$, $p = .001$], with a large effect size (*partial* $\eta^2 = .15$), indicating a significant decrease over time.

Table 14

Means and standard deviations of the different predictor variables throughout the weeks

		Before		***During***		***After***	
	n	*M*	*SD*	*M*	*SD*	*M*	*SD*
COVID-19	49	12.45	5.42	-	-	-	-
Resilience	49	2.92	0.74	3.16	0.62	3.28	0.68
Stress Mindset	49	2.31	0.59	2.19	0.47	2.22	0.56
Intolerance of Uncertainty	49	36.65	9.70	34.82	9.58	34.73	8.87
Prospective anxiety	49	21.80	5.81	20.96	5.93	21.02	5.19
Inhibitory anxiety	49	14.86	4.74	13.86	4.24	13.71	4.28
Loneliness	49	6.37	1.90	6.02	1.51	5.53	1.62
Sense of belonging	49	5.61	2.15	5.52	2.17	5.54	2.36
Fear of missing out	49	3.67	1.09	3.73	0.91	3.41	1.19

Hypothesis 8-13. In Table 15, the correlations between perceived stress and the predictor variables can be found. Almost all correlations were significant before the course, ranging from low (e.g., stress mindset and perceived stress) to moderate (e.g., resilience and perceived stress). During the course, only the correlations with the predictor variables of resilience, intolerance of uncertainty, sense of belonging and loneliness were significant. After the course, resilience, intolerance of uncertainty, loneliness and sense of belonging had the only significant correlations with perceived stress.

Table 15

Correlation between perceived stress and predictor variables over the weeks

	Before	During	After
Variable	*r*	*r*	*r*
Resilience	-.630**	-.555**	-.533**
Intolerance of uncertainty	.576**	.539**	.601**
Loneliness	.482**	.556**	.393**
Sense of belonging	-.518**	-.287*	-.299*
Fear of missing out	.310*	.226	.221
COVID	.434**	-	-
Stress Mindset	.104	-.152	-.046

Note. * significant at .05 level, ** significant at .01 level

Hypothesis 14-17. In Table 16, the correlations between wellbeing and the predictor variables can be found. Almost all correlations were significant before the course, ranging from low (e.g., stress mindset and wellbeing) to moderate (e.g., loneliness and wellbeing). During the course, the correlations with the predictor variables of resilience, loneliness and intolerance of uncertainty were significant. After the course, the predictor variables of resilience, intolerance of uncertainty and loneliness were significantly correlated with wellbeing, indicated by a moderate correlation strength.

Table 16

Correlation between wellbeing and predictor variables over the weeks

	Before	During	After
Variable	*r*	*r*	*r*
Resilience	.450**	.429**	.443**
Loneliness	-.460**	-.627**	-.495**
COVID	-.454**	-	-
Intolerance of uncertainty	-.440**	-.391**	-.450**
Sense of belonging	.346*	.250	.209
Stress Mindset	-.195	-.193	-.200
Fear of missing out	-.237	-.132	-.224

Note. * significant at .05 level, ** significant at .01 level

Regression model of perceived stress. A multiple regression analysis was run to predict perceived stress from the predictor variables before the course (see Table 17). The variables of resilience and sense of belonging significantly predicted perceived stress $F(7, 41) = 11.334$. In other words, these variables added statistically significantly to the prediction, $p < .05$.

Table 17

Regression model of perceived stress and the predicting variables

	B	SE B	ß	*p*
Resilience	-4.600	1.515	-.359	.004
Sense of Belonging	-1.224	0.470	-.275	.013
Intolerance of uncertainty	0.220	0.110	.112	.052
COVID	0.330	0.179	.187	.073
Fear of missing out	1.540	0.887	.175	.090
Loneliness	0.329	0.638	.065	.609
Stress Mindset	-0.755	1.760	-.046	.670

Note. B=Unstandardized coefficient; SE B = Standard error unstandardized coefficient; ß = Standard coefficient;

Regression model of wellbeing. A multiple regression analysis was run to predict wellbeing from the predictor variables (see Table 18). The variable of COVID significantly predicted wellbeing $F(7, 41) = 4.343$. In other words, this variable added statistically significantly to the prediction, $p < .05$.

Table 18

Regression model of wellbeing and the predicting variables

	B	SE B	ß	*p*
COVID	-0.052	0.026	-.269	.048
Intolerance of uncertainty	-0.023	0.016	-.215	.146
Resilience	0.220	0.216	.156	.314
Sense of Belonging	0.064	0.067	.131	.346
Loneliness	-0.069	0.091	-.124	.455
Fear of missing out	-0.087	0.126	-.091	.492
Stress Mindset	-0.134	0.251	-.075	.595

Note. B=Unstandardized coefficient; SE B = Standard error unstandardized coefficient; ß = Standard coefficient;

Mediation analysis

Hypothesis 18-19. Regarding mindfulness, no significant main effect of time was found [$F(10.463, 880.871) = 0.570$, $p = .567$]. Mindfulness was measured with the MAAS with a mean score of 17.57 (SD = .5.37) before the course, 17.27 (SD = 4.71) during the course and 17.92 (SD = 4.77) after the course. Furthermore, a significant negative correlation between perceived stress and mindfulness before the course was found (r = -.58, p = .000). The correlation between perceived stress and mindfulness stayed significant during the course (r = -.44, p = .000) and after the course (r = -.37, p = .008). Additionally, a significant positive correlation between wellbeing and mindfulness before the course was found (r = .47, p = .001). The correlation between wellbeing and mindfulness became non-significant during the course (r = .27, p = .066) and after the course (r = .27 p = .066). An overview of the correlations of mindfulness with the different predictor variables can be found in Table 19.

Table 19

Correlation between perceived stress and predictor variables over the weeks

	BRS	SMM	IUS	LON	SoB	FoMO	COVID
Mindfulness	.224	.138	-.492**	-.184	.293*	-.349*	-.107
	.189	.279	-.543**	-.168	.163	-.120	
	.294*	.223	-.402**	-.229	.171	-.203	

Note. * significant at .05 level, ** significant at .01 level; BRS = Resilience, SMM = Stress Mindset, IUS = Intolerance of Uncertainty, LON = Loneliness, SoB = Sense of Belonging, FoMO = Fear of Missing Out, COVID = Covid-19 Impact

In Table 20, the change scores from pre to post-survey can be found per variable and group. A positive value indicates an increase of the variable score from pre to post and a negative value indicates a decrease of the variable score from pre to post.

Table 20

Change scores of the different variable from pre to post survey per adherence level group

	MAAS	FoMO	BRS	SMM	IUS	LON	SoB	PSS	MHC
Low (N = 10)									
M	-0.50	-0.30	0.55	- 0.15	- 4.00	- 0.30	0.03	- 7.70	0.27
SD	3.50	1.06	0.59	0.42	8.58	0.67	2.50	6.20	0.37
Medium (N = 18)									
M	-0.39	0	0.25	- 0.17	- 0.44	- 0.39	- 0.33	- 0.72	0.07
SD	5.34	1.37	0.44	0.58	5.78	1.50	2.00	9.19	0.50
High (N = 21)									
M	1.38	- 0.48	0.37	0	- 2.19	- 1.48	0.10	- 5.95	0.32
SD	5.15	1.33	0.46	0.46	5.57	1.72	1.84	6.00	0.71

Note. MAAS = Mindfulness, FoMO = Fear of Missing Out, BRS = Resilience, SMM = Stress Mindset, IUS = Intolerance of Uncertainty, LON = Loneliness, SoB = Sense of Belonging, PSS = Perceived Stress, MHC = Wellbeing

Several multiple regression models were run to test the direct effect of adherence level on the different predictor variables. Adherence levels only had a significant influence on loneliness [$F(1, 47) = 5.579$, $p = .022$]. The direct effects of adherence level on the remaining predictor variables were all non-significant. Next, the direct effect of adherence level on mindfulness was tested and turned out to be non-significant [$F(1, 47) = 1.324$, $p = .256$]. Then, the direct effect of mindfulness on the predictor variables was tested and a significant direct effect of mindfulness on resilience was found [$F(1, 47) = 6.214$, $p = .016$]. In other words, mindfulness did significantly influence resilience but did not act as a mediator between the adherence levels and predictor variables.

Next, the direct effect of adherence level on the outcome variables of perceived stress and wellbeing was tested with two multiple regression models. Both direct effects of adherence level on the outcome variables were non-significant, [$F(1, 47) = 0.00$, $p = .995$] for perceived stress and [$F(1, 47) = 0.240$, $p = .626$] for wellbeing respectively. A direct significant effect of mindfulness on wellbeing was found [$F(1, 47) = 9.516$, $p = .003$]. The direct effect of mindfulness on perceived stress was non-significant [$F(1, 47) = 2.817$, $p = .100$]. In other

words, mindfulness did significantly influence wellbeing but did not act as a mediator between the adherence levels and outcome variables.

Overview of the hypotheses

In Table 21, an overview of the hypotheses and the accommodating answer can be found.

Table 21

Overview of the tested hypotheses

	Hypothesis	Answer	Comment
H1	Perceived stress levels will significantly decrease throughout the online wellbeing course	Accepted	
H2	Wellbeing levels will significantly increase throughout the online wellbeing course	Accepted	
H3	Resilience levels will significantly increase throughout the online wellbeing course	Accepted	
H4	Sense of belonging levels will significantly increase throughout the online wellbeing course	Rejected	
H5	Stress mindset levels will significantly increase throughout the online wellbeing course	Rejected	
H6	Intolerance of uncertainty levels will significantly decrease throughout the online wellbeing course	Accepted	
H7	Loneliness levels will significantly decrease throughout the online wellbeing course	Accepted	
H8	Resilience will be significantly negatively correlated with perceived stress	Accepted	Significant during all weeks
H9	Intolerance of uncertainty will be significantly positively correlated with perceived stress	Accepted	Significant during all weeks
H10	Fear of missing out will be significantly positively correlated with perceived stress	Partly accepted	Significant before the course
H11	Loneliness will be significantly positively correlated with perceived stress	Accepted	Significant during all weeks
H12	Stress mindset will be significantly negatively correlated with perceived stress	Rejected	

H13	Sense of belonging will be significantly negatively correlated with perceived stress	Accepted	Significant during all weeks
H14	Resilience will be significantly positively correlated with wellbeing	Accepted	Significant during all weeks
H15	Intolerance of uncertainty will be significantly negatively correlated with wellbeing	Accepted	Significant during all weeks
H16	Loneliness will be significantly negatively correlated with wellbeing	Accepted	Significant during all weeks
H17	Sense of belonging will be significantly positively correlated with wellbeing	Partly accepted	Significant before the course
H18	Mindfulness levels will significantly increase throughout the online wellbeing course	Rejected	
H19	Mindfulness will function as a mediator between the intervention adherence and predictor variables of perceived stress and wellbeing	Rejected	

Discussion

In this pilot study, the feasibility and effectiveness of a short online wellbeing course for University of Twente students was investigated for effects on wellbeing and perceived stress using loneliness, resilience, stress mindset, sense of belonging, intolerance of uncertainty, fear of missing out as predictors (see Kelders et al., 2019), COVID-19 Impact as control and mindfulness as a possible mediator. Overall, the course was evaluated as very feasible by participants during the interviews regarding the amount of time invested, online setting and content of the course. Participants mentioned some minor improvements to the course for the future but seemed overall satisfied with the current version. Regarding the effectiveness, preliminary results showed that perceived stress significantly decreased and wellbeing levels significantly increased throughout the course. Additionally, the regression model of perceived stress and wellbeing by Kelders et al. (2019) could only be partly confirmed with the preliminary results. While the correlations were very similar to the Kelders et al. (2019), only a few of the predictor variables were found to predict perceived stress and wellbeing. Interestingly, the mindfulness levels of students did not significantly increase throughout the

course. Against initial expectations, mindfulness did also not function as a mediator between the course adherence and the predictor nor outcome variables.

Starting with the feasibility of the course, participants indicated in the interview that they liked the online setting of the course but would prefer a blended setting in the future with the materials being online and the live sessions held offline. These results are similar to research from other areas such as psychotherapy, where it was shown that the reduction of stress, depression and anxiety in students was most effective with blended care (Borjalilu, Mazaheri, & Talebpour, 2019). Of course, as stated by Wentzel, van der Vaart, Bohlmeijer and van Gemert-Pijnen (2016), personalization is of crucial importance here since it is not clear what for whom blended care works the best and most efficiently. For instance, Kern, Hong, Song, Lipson and Eisenberg (2018) stated that online mental health apps are more convenient and accessible in terms of time and resources for students. Research by Wahbeh et al. (2014) also showed that students preferred an online mindfulness-based intervention over a group or one-by-one intervention. Taking these aspects into account for a future course setting, participants should have the option to choose from a course that is completely held online or partly online and offline.

Going further with the primary outcomes of the study, perceived stress levels before the course were slightly higher than in Kelders et al. (2019). In the current study, a positive correlation between perceived stress and COVID was found, therefore, one reason for the increase could be the COVID-19 circumstances. Perceived stress levels were shown to decrease throughout the course, which is in line with previous research showing that participation in offline mindfulness courses decreases perceived stress levels (Carr et al., 2020; Bränsträm et al., 2010; Speca, Carlson, Goodey, & Angen, 2000; Lengacher et al., 2009). Thus, the online course seems to be equally effective in reducing perceived stress levels than offline courses based on the preliminary results. Additionally, the results are also similar to the research of Zollars et al. (2019), showing a decrease in perceived stress levels by making usage of the mindfulness app Headspace.

Furthermore, wellbeing levels before the course were found to be slightly lower than in Kelders et al. (2019). Again, this slight reduction could be due to the COVID-19 circumstances since a negative correlation between wellbeing and COVID was found in the current study. Wellbeing levels were shown to increase throughout the course, which is once again similar to what Carr et al. (2020) found in their offline mindfulness course and Zollars et al. (2019) with the usage of Headspace.

Against initial expectations, mindfulness levels did not increase throughout the course and mindfulness also did not have any mediating effect on the predictor variables or outcome variables of perceived stress and wellbeing. These results contradict the finding of Bränström et al. (2010) who have shown that mindfulness has a mediating effect on psychological well-being when participating in an offline mindfulness training course. Previous studies by Nyklíček and Kuijpers (2008) and Oman et al. (2008) also found a mediating effect of mindfulness on psychological outcomes. One important difference is that the current study was held online and that the focus of this course was not solely on mindfulness alone by integrating both mindfulness and positive psychology exercises. Another difference is that mindfulness was measured with the MAAS scale in the current study while other studies measured mindfulness with the FFMQ (see Bränström et al., 2010). The MAAS scale measures dispositional mindfulness with one dimension, while the FFMQ measures mindfulness more extensively on five dimensions (see Park, Reilly-Spong & Gross, 2013). Thus, it could be that there are dimensions of mindfulness within the FFMQ that have a mediating effect but that these have not been captured by the one-dimensional MAAS scale used in the current study. Therefore, the question remains whether the mediating effects of mindfulness are due to the measurement type.

Regarding the prediction model of perceived stress, the model of Kelders et al. (2019) could be partly confirmed with resilience and sense of belonging as potential predictors of perceived stress. In contrast, the prediction model of wellbeing (Kelders et al., 2019) could not be confirmed since COVID and mindfulness were found to be predictors of wellbeing in the current study. One explanation could be that the COVID-19 circumstances, which were present in the current study but not in the study of Kelders et al. (2019), induced a change in these prediction models. Since mindfulness was also not measured in the study of Kelders et al. (2019), no complete comparisons can be made in terms of prediction models. However, the correlations found between predictor variables and outcome variables were very similar to the results of Kelders et al. (2019). Thus, the results and interpretation regarding the prediction models should be taken with caution due to the differences in sample size and the type of research and would need further research for confirmation.

Strengths and limitations

One strength of the current pilot study is the mixed methods approach of surveys and interviews. The different surveys over time provided a good overview of the different factors and their development over time, including the improvements of perceived stress and wellbeing. Of course, these results should be treated with caution since they are only preliminary and need

to be confirmed by more extensive and larger research in the future. The interviews also gave valuable insight into participants' experience of the course, which in the end helped to make an overall evaluation of the online wellbeing course.

Another strength is the inclusion and correlations of many factors that were previously shown to influence perceived stress and wellbeing. By repeatedly measuring these factors with a longitudinal setup, the influence of the content and the subsequent development of the factors over the weeks could be investigated. Some factors did indeed change over time, which would not have been detected with a single measurement.

In turn, one limitation of the current study is the relatively small sample size, which restricted the number of additional exploratory analyses that could be conducted as the groups were very unequally distributed. More specifically, exploratory analyses of demographics such as gender or nationality on the different outcome and predictor variables could thus not be executed. However, since the study was a pilot study with the aim of exploring and gaining some first insights into the effectiveness and feasibility, these problems are less important in this particular context.

Another possible limitation is that the different variables were measured with self-report questionnaires, which can be quite subjective also regarding the actual effectiveness of the intervention. In other words, it could be that the self-reported data overestimate the effectiveness of the intervention. However, since the nature of the pilot study was to get some first insight into the effectiveness of the course, this problem is of less importance at this point in time.

Furthermore, the measurement points in time for the different variables were sometimes not equally distributed, which could maybe result in higher values for one variable than for the other. For instance, wellbeing was measured for the second time after the first week, while perceived stress was measured for the second time after the second week. However, the measurement points were determined for each variable based on the topics of the weeks, meaning that wellbeing was measured after the first week since the first week tackled some concepts of wellbeing. Additionally, all variables were measured at the same time again after the course in a post-survey, which enables a direct comparison of pre- and post-scores.

Additionally, the attendance during the live sessions can be seen as another limitation since it was generally quite low and decreased throughout the weeks. One reason for this could be the timing when the course was offered since some participants also indicated that some weeks were very busy in terms of their study program. Another reason could be that participants

simply forgot about the live sessions as indicated in the interviews. The question arises of course if the course would be even more effective with proper attendance levels.

Lastly, the positive outcomes in terms of effectiveness and high feasibility should be interpreted with caution due to the sample characteristics of the surveys and interviews. Almost all of the participants that took part in the interviews filled in all surveys and were also very interested in mindfulness, which was clearly visible in their reasons for participation. Participants that did not fill in all surveys but indicated an interest in the interview were also approached and asked for an interview, however most of them did not want to participate anymore or did not respond to the invitation. Therefore, the question remains whether the sample characteristics and bias in drop-out explain the results of the effectiveness and feasibility. However, once again, the aim of the pilot study was to give some first indication of the effectiveness and feasibility, with more research needed in the future to make clear conclusions.

Future research

Overall, the current pilot study and improvements of the course can be used as a basis for another, larger pilot or follow-up study that focuses on intervention refinement and the confirmation of results. Firstly, it would be interesting to measure the effectiveness of the course over a longer time, for instance, with a follow-up measurement after some months. This suggestion is based on the research of Moore et al. (2020), where it was shown that the impact on perceived stress levels was largest after a 4-month follow-up measurement. In other words, there might be a later effect of the course on the different factors, which could be captured with follow-up measurements.

Secondly, the number of measured variables could be expanded since concepts such as gratitude, self-compassion, or self-regulation were shown to influence wellbeing and perceived stress (see Poots & Cassidy, 2020; Durand-Bush, McNeill, Harding, & Dobransky, 2015; O' Leary & Dockray, 2015). Also, the concept of wellbeing could be measured with more positive psychology measurements such as overall happiness and life satisfaction to get a more in-depth insight (see Cho, Yoo, & Park, 2021). Additionally, mindfulness could be measured more extensively with, for instance, the FFMQ (see Bränström et al., 2010).

Thirdly, different types of measurements could be included in future research that would give more insight into objective markers of mental health. For instance, the study of Schultchen et al. (2020) included psychobiological measurements such as hair cortisol, FKBP5 genotype and interoceptive accuracy. Unfortunately, the study of Schultchen et al. (2020) is still ongoing and no results have been yet published about the psychobiological measurements.

Furthermore, more in-depth analyses should be conducted since it was repeatedly shown that different demographic factors such as gender or nationality influence perceived stress and wellbeing levels. For proper analyses, it is thus important to conduct a large-scale study or several smaller-scale studies with more diversity in terms of participant characteristics. In addition, the adherence levels could also then be compared and analyzed more in-depth.

Additionally, it would be interesting to investigate to what extent the course setting itself contributes to the effectiveness of the course. As mentioned above, both online and blended settings seem to have their advantages and disadvantages and depend on the individual. Therefore, by providing two types of course settings based on the participants' preferences and comparing these with each other, the effectiveness of the course could be explored more in-depth.

Conclusion

The preliminary results of the pilot study demonstrated that the short online wellbeing course provides a feasible and effective way to increase wellbeing and decrease perceived stress among students. With some minor improvements mentioned during the interviews, it is recommended to conduct a large-scale pilot or follow-up study of the course to further refine the intervention and possibly confirm the current results.

References

Abolghasemi, A., & Varaniyab, S. T. (2010). Resilience and perceived stress: predictors of life satisfaction in the students of success and failure. *Procedia - Social and Behavioral Sciences, 5,* 748-752. https://doi.org/10.1016/j.sbspro.2010.07.178

Adlaf, E. M., Gliksman, L., Demers, A., & Newton-Taylor, B. (2001). The Prevalence of Elevated Psychological Distress Among Canadian Undergraduates: Findings from the 1998 Canadian Campus Survey. *Journal of American College Health, 50(2),* 67-72. https://doi.org/10.1080/07448480109596009

Baer, R. A. (2003). Mindfulness training as a clinical intervention: A conceptual and empirical review. *Clinical Psychology: Science and Practice, 10(2),* 125-143. https://doi.org/10.1093/clipsy.bpg015

Bamber, M. D., & Morpeth, E. (2019). Effects of Mindfulness Meditation on College Student Anxiety: a Meta-Analysis. Mindfulness, 10(2), 203-214. https://doi.org/10.1007/s12671-018-0965-5

Barrable, A., Papadatou-Pastou, M., & Tzotzoli, P. (2018). Supporting mental health, wellbeing and study skills in Higher Education: an online intervention system. *International Journal of Mental Health Systems, 12(1),* 54. https://doi.org/10.1186/s13033-018-0233-z

Bayram, N., & Bilgel, N. (2008). The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. *Social Psychiatry and Psychiatric Epidemiology, 43(8),* 667-672. https://doi.org/10.1007/s00127-008-0345-x

Beddoe, A. E., & Murphy, S. O. (2004). Does Mindfulness Decrease Stress and Foster Empathy Among Nursing Students? *Journal of Nursing Education, 43(7),* 305-312. https://doi.org/doi:10.3928/01484834-20040701-07

Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical Psychology: Science and Practice, 11(3),* 230-241. https://doi.org/10.1093/clipsy.bph077

Blanco, C., Okuda, M., Wright, C., Hasin, D. S., Grant, B. F., Liu, S.-M., & Olfson, M. (2008). Mental Health of College Students and Their Non–College-Attending Peers:

Results From the National Epidemiologic Study on Alcohol and Related Conditions. *Archives of General Psychiatry, 65(12),* 1429-1437. https://doi.org/10.1001/archpsyc.65.12.1429

Borjalilu, S., Mazaheri, M. A., & Talebpour, A. (2019). Effectiveness of Mindfulness-Based Stress Management in The Mental Health of Iranian University Students: A Comparison of Blended Therapy, Face-to-Face Sessions, and mHealth App (Aramgar). *Iranian Journal of Psychiatry and Behavioral Sciences, 13(2),* 1-9. https://doi.org/10.5812/ijpbs.84726

Bränström, R., Kvillemo, P., Brandberg, Y., & Moskowitz, J. T. (2010). Self-report Mindfulness as a Mediator of Psychological Well-being in a Stress Reduction Intervention for Cancer Patients—A Randomized Study. *Annals of Behavioral Medicine, 39(2),* 151-161. https://doi.org/10.1007/s12160-010-9168-6

Bryant, F. B., & Veroff, J. (2017). Savoring: A new model of positive experience. Psychology Press.

Butzer, B., & Kuiper, N. A. (2006). Relationships between the frequency of social comparisons and self-concept clarity, intolerance of uncertainty, anxiety, and depression. *Personality and Individual Differences, 41(1),* 167-176. https://doi.org/10.1016/j.paid.2005.12.017

Cacioppo, J., Hughes, M., Waite, L., Hawkley, L., & Thisted, R. (2006). Loneliness as a Specific Risk Factor for Depressive Symptoms: Cross-Sectional and Longitudinal Analyses. *Psychology and aging, 21,* 140-151. https://doi.org/10.1037/0882-7974.21.1.140

Carleton, R. N., Norton, M. A. P. J., & Asmundson, G. J. G. (2007). Fearing the unknown: A short version of the Intolerance of Uncertainty Scale. *Journal of Anxiety Disorders, 21(1),* 105-117. https://doi.org/10.1016/j.janxdis.2006.03.014

Carmody, J. (2009). Evolving Conceptions of Mindfulness in Clinical Settings. *Journal of Cognitive Psychotherapy (3),* 270-280. https://doi.org/10.1891/0889-8391.23.3.270

Carr, A., Cullen, K., Keeney, C., Canning, C., Mooney, O., Chinseallaigh, E., & O'Dowd, A. (2020). Effectiveness of positive psychology interventions: a systematic review and meta-analysis. *The Journal of Positive Psychology,* 1-21. https://doi.org/10.1080/17439760.2020.1818807

CBS (2021). Perceived mental health: trend stable in 2020. Retrieved from https://www.cbs.nl/en-gb/news/2021/09/perceived-mental-health-trend-stable-in-2020

Chen, C. P. (1999). Professional Issues: Common Stressors Among International College Students: Research and Counseling Implications. *Journal of College Counseling, 2(1),* 49-65. https://doi.org/10.1002/j.2161-1882.1999.tb00142.x

Chiauzzi, E., Brevard, J., Thurn, C., Decembrele, S., & Lord, S. (2008). "MyStudentBody-Stress: An online stress management intervention for college students" Erratum. *Journal of Health Communication, 13(8),* 827-827. https://doi.org/10.1080/10810730802619404

Cho, H., Yoo, S.-K., & Park, C. J. (2021). The relationship between stress and life satisfaction of Korean University students: mediational effects of positive affect and self-compassion. *Asia Pacific Education Review, 22(3),* 385-400. https://doi.org/10.1007/s12564-021-09676-y

Conley, C. S., Shapiro, J. B., Huguenel, B. M., & Kirsch, A. C. (2020). Navigating the College Years: Developmental Trajectories and Gender Differences in Psychological Functioning, Cognitive-Affective Strategies, and Social Well-Being. *Emerging Adulthood, 8(2),* 103-117. https://doi.org/10.1177/2167696818791603

Cooke, R., Bewick, B. M., Barkham, M., Bradley, M., & Audin, K. (2006). Measuring, monitoring and managing the psychological well-being of first year university students. *British Journal of Guidance & Counselling, 34(4),* 505-517. https://doi.org/10.1080/03069880600942624

Cook, L. J. (2007). Striving to Help College Students with Mental Health Issues. *Journal of Psychosocial Nursing and Mental Health Services, 45(4),* 40-44. https://doi.org/doi:10.3928/02793695-20070401-09

Crowther, L. L., Robertson, N., & Anderson, E. S. (2020). Mindfulness for undergraduate health and social care professional students: Findings from a qualitative scoping review using the 3P model. *Medical Education, 54(9),* 796-810. https://doi.org/https://doi.org/10.1111/medu.14150

Crum, A. J., Akinola, M., Martin, A., & Fath, S. (2017). The role of stress mindset in shaping cognitive, emotional, and physiological responses to challenging and threatening

stress. *Anxiety, Stress, & Coping, 30(4),* 379-395. https://doi.org/10.1080/10615806.2016.1275585

Crum, A. J., Salovey, P., & Achor, S. (2013). Rethinking stress: The role of mindsets in determining the stress response. *Journal of Personality and Social Psychology, 104(4),* 716-733. https://doi.org/10.1037/a0031201

Cuijpers, P., Donker, T., van Straten, A., Li, J., & Andersson, G. (2010). Is guided self-help as effective as face-to-face psychotherapy for depression and anxiety disorders? A systematic review and meta-analysis of comparative outcome studies. *Psychological Medicine, 40(12),* 1943-1957. https://doi.org/10.1017/S0033291710000772

Deckro, G. R., Ballinger, K. M., Hoyt, M., Wilcher, M., Dusek, J., Myers, P., Greenberg, B., Rosenthal, D. S., & Benson, H. (2002). The Evaluation of a Mind/Body Intervention to Reduce Psychological Distress and Perceived Stress in College Students. *Journal of American College Health, 50(6),* 281-287. https://doi.org/10.1080/07448480209603446

Dodge, R., Daly, A., Huyton, J., & Sanders, L. (2012). The challenge of defining wellbeing. *International Journal of Wellbeing,* 2. https://doi.org/10.5502/ijw.v2i3.4

Downs, M. F., & Eisenberg, D. (2012). Help Seeking and Treatment Use Among Suicidal College Students. *Journal of American College Health, 60(2),* 104-114. https://doi.org/10.1080/07448481.2011.619611

Dulin, A. J., Dale, S. K., Earnshaw, V. A., Fava, J. L., Mugavero, M. J., Napravnik, S., Hogan, J. W., Carey, M. P., & Howe, C. J. (2018). Resilience and HIV: a review of the definition and study of resilience. AIDS Care, 30, 6-17. https://doi.org/10.1080/09540121.2018.1515470

Dunn, L. B., Iglewicz, A., & Moutier, C. (2008). A Conceptual Model of Medical Student Well-Being: Promoting Resilience and Preventing Burnout. *Academic Psychiatry, 32(1),* 44-53. https://doi.org/10.1176/appi.ap.32.1.44

Durand-Bush, N., McNeill, K., Harding, M., & Dobransky, J. (2015). Investigating Stress, Psychological Well-Being, Mental Health Functioning, and Self-Regulation Capacity Among University Undergraduate Students: Is This Population Optimally Functioning? *Canadian Journal of Counselling and Psychotherapy, 49,* 253-274.

EM (2020). Studenten hebben meer psychische problemen door de coronacrisis. Retrieved from https://www.erasmusmagazine.nl/2020/09/23/studenten-hebben-meer-psychische-problemen-door-de-coronacrisis/

Eisenberg, D., Hunt, J., & Speer, N. (2013). Mental Health in American Colleges and Universities: Variation Across Student Subgroups and Across Campuses. *The Journal of Nervous and Mental Disease, 201(1),* 60-67. https://doi.org/10.1097/NMD.0b013e31827ab077

Frank, J. L., Reibel, D., Broderick, P., Cantrell, T., & Metz, S. (2015). The Effectiveness of Mindfulness-Based Stress Reduction on Educator Stress and Well-Being: Results from a Pilot Study. *Mindfulness, 6(2),* 208-216. https://doi.org/10.1007/s12671-013-0246-2

Frijda, N. H., & Sundararajan, L. (2007). Emotion Refinement: A Theory Inspired by Chinese Poetics. *Perspectives on Psychological Science, 2(3),* 227-241. https://doi.org/10.1111/j.1745-6916.2007.00042.x

Gable, S. L., & Haidt, J. (2005). What (and Why) is Positive Psychology? *Review of General Psychology, 9(2),* 103-110. https://doi.org/10.1037/1089-2680.9.2.103

Garland, E. L., Farb, N. A., R. Goldin, P., & Fredrickson, B. L. (2015). Mindfulness Broadens Awareness and Builds Eudaimonic Meaning: A Process Model of Mindful Positive Emotion Regulation. *Psychological Inquiry, 26(4),* 293-314. https://doi.org/10.1080/1047840X.2015.1064294

Gellatly, J., Bower, P., Hennessy, S. U. E., Richards, D., Gilbody, S., & Lovell, K. (2007). What makes self-help interventions effective in the management of depressive symptoms? Meta-analysis and meta-regression. *Psychological Medicine, 37(9),* 1217-1228. https://doi.org/10.1017/S0033291707000062

Grant, L., & Kinman, G. (2012). Enhancing Wellbeing in Social Work Students: Building Resilience in the Next Generation. *Social Work Education, 31(5),* 605-621. https://doi.org/10.1080/02615479.2011.590931

Hagerty, B. M., Lynch-Sauer, J., Patusky, K. L., Bouwsema, M., & Collier, P. (1992). Sense of belonging: a vital mental health concept. *Archives of Psychiatric Nursing, 6(3),* 172-177. https://doi.org/10.1016/0883-9417(92)90028-h

Hamza, C. A., Ewing, L., Heath, N. L., & Goldstein, A. L. (2021). When social isolation is nothing new: A longitudinal study on psychological distress during COVID-19 among university students with and without preexisting mental health concerns. *Canadian Psychology/Psychologie canadienne, 62(1),* 20-30. https://doi.org/10.1037/cap0000255

Hanauer, D., Dibble, E., Fortin, J., & Col, N. F. (2004). Internet Use Among Community College Students: Implications in Designing Healthcare Interventions. *Journal of American College Health, 52(5),* 197-202. https://doi.org/10.3200/JACH.52.5.197-202

Hausmann, L. R. M., Schofield, J. W., & Woods, R. L. (2007). Sense of Belonging as a Predictor of Intentions to Persist Among African American and White First-Year College Students. *Research in Higher Education, 48(7),* 803-839. https://doi.org/10.1007/s11162-007-9052-9

Heisserer, D. L., & Parette, P. (2002). Advising at-risk students in college and university settings. *College Student Journal, 36(1),* 69-83.

Herrero, R., Mira, A., Cormo, G., Etchemendy, E., Baños, R., García-Palacios, A., Ebert, D. D., Franke, M., Berger, T., Schaub, M. P., Görlich, D., Jacobi, C., & Botella, C. (2019). An Internet based intervention for improving resilience and coping strategies in university students: Study protocol for a randomized controlled trial. *Internet Interventions, 16,* 43-51. https://doi.org/10.1016/j.invent.2018.03.005

Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A Short Scale for Measuring Loneliness in Large Surveys: Results From Two Population-Based Studies. *Research on Aging, 26(6),* 655-672. https://doi.org/10.1177/0164027504268574

Husky, M. M., Kovess-Masfety, V., & Swendsen, J. D. (2020). Stress and anxiety among university students in France during Covid-19 mandatory confinement. *Comprehensive Psychiatry, 102,* 152-191. https://doi.org/10.1016/j.comppsych.2020.152191

Ivtzan, I., Young, T., Martman, J., Jeffrey, A., Lomas, T., Hart, R., & Eiroa-Orosa, F. J. (2016). Integrating Mindfulness into Positive Psychology: a Randomised Controlled Trial of an Online Positive Mindfulness Program. *Mindfulness, 7(6),* 1396-1407. https://doi.org/10.1007/s12671-016-0581-1

Johansson, R., & Andersson, G. (2012). Internet-based psychological treatments for depression. *Expert Review of Neurotherapeutics, 12(7),* 861-870. https://doi.org/10.1586/ern.12.63

Kabat-Zinn, J. (2003). Mindfulness-based interventions in context: Past, present, and future. *Clinical Psychology: Science and Practice, 10(2),* 144-156. https://doi.org/10.1093/clipsy.bpg016

Kabat-Zinn, J. (2013). *Full catastrophe living, revised edition: how to cope with stress, pain and illness using mindfulness meditation*. Hachette UK.

Kang, Y. S., Choi, S. Y., & Ryu, E. (2009). The effectiveness of a stress coping program based on mindfulness meditation on the stress, anxiety, and depression experienced by nursing students in Korea. *Nurse Education Today, 29(5),* 538-543. https://doi.org/10.1016/j.nedt.2008.12.003

Kelders, S., Oberschmidt, K., & Bohlmeijer, E. (2019). Student Wellbeing: A Cross-sectional Survey of Mental Health of UT-students.

Kern, A., Hong, V., Song, J., Lipson, S. K., & Eisenberg, D. (2018). Mental health apps in a college setting: openness, usage, and attitudes. *mHealth, 4,* 1-12. https://doi.org/10.21037/mhealth.2018.06.01

Keyes, C. L. M., & Lopez, S. J. (2002). Toward a science of mental health: Positive directions in diagnosis and interventions. In C.R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 45-59). Oxford University Press.

Kitzrow, M. A. (2003). The Mental Health Needs of Today's College Students: Challenges and Recommendations. *Journal of Student Affairs Research and Practice, 41(1),* 167-181. https://doi.org/doi:10.2202/1949-6605.1310

Klatt, M. D., Buckworth, J., & Malarkey, W. B. (2009). Effects of Low-Dose Mindfulness-Based Stress Reduction (MBSR-ld) on Working Adults. Health Education & *Behavior, 36(3),* 601-614. https://doi.org/10.1177/1090198108317627

Krusche, A., Cyhlarova, E., King, S., & Williams, J. M. G. (2012). Mindfulness online: a preliminary evaluation of the feasibility of a web-based mindfulness course and the impact on stress. *BMJ Open, 2(3).* https://doi.org/10.1136/bmjopen-2011- 000803

Kwan, M. Y. W., Brown, D., MacKillop, J., Beaudette, S., Van Koughnett, S., & Munn, C. (2021). Evaluating the impact of Archway: a personalized program for 1st year student success and mental health and wellbeing. *BMC Public Health, 21(1),* 59. https://doi.org/10.1186/s12889-020-10057-0

Laidlaw, A., McLellan, J., & Ozakinci, G. (2016). Understanding undergraduate student perceptions of mental health, mental well-being and help-seeking behaviour. *Studies in Higher Education, 41(12),* 2156-2168. https://doi.org/10.1080/03075079.2015.1026890

Lamers, S. M., Westerhof, G. J., Bohlmeijer, E. T., ten Klooster, P. M., & Keyes, C. L. (2011). Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF). *Journal of Clinical Psychology, 67(1),* 99-110. https://doi.org/10.1002/jclp.20741

Larcombe, W., Finch, S., Sore, R., Murray, C. M., Kentish, S., Mulder, R. A., Lee-Stecum, P., Baik, C., Tokatlidis, O., & Williams, D. A. (2016). Prevalence and socio-demographic correlates of psychological distress among students at an Australian university. *Studies in Higher Education, 41(6),* 1074-1091. https://doi.org/10.1080/03075079.2014.966072

Lazarus, R. S., & Folkman, S. (1987). Transactional theory and research on emotions and coping. European Journal of Personality, 1(3, Spec Issue), 141-169. https://doi.org/10.1002/per.2410010304

Lazarus, R. S., & Launier, R. (1978). Stress-Related Transactions between Person and Environment. In L. A. Pervin & M. Lewis (Eds.), *Perspectives in Interactional Psychology* (pp. 287-327). Springer US. https://doi.org/10.1007/978-1-4613-3997-7_12

Lengacher, C. A., Johnson-Mallard, V., Post-White, J., Moscoso, M. S., Jacobsen, P. B., Klein, T. W., Widen, R. H., Fitzgerald, S. G., Shelton, M. M., Barta, M., Goodman, M., Cox, C. E., & Kip, K. E. (2009). Randomized controlled trial of mindfulness-based stress reduction (MBSR) for survivors of breast cancer. *Psycho-Oncology, 18(12),* 1261-1272. https://doi.org/10.1002/pon.1529

Lin, S.-H., & Huang, Y.-C. (2014). Life stress and academic burnout. *Active Learning in Higher Education, 15(1),* 77-90. https://doi.org/10.1177/1469787413514651

Lipson, S. K., Zhou, S., Wagner, B., Beck, K., & Eisenberg, D. (2016). Major Differences: Variations in Undergraduate and Graduate Student Mental Health and Treatment Utilization Across Academic Disciplines. *Journal of College Student Psychotherapy, 30(1),* 23-41. https://doi.org/10.1080/87568225.2016.1105657

Misra, R., & McKean, M. (2000). College students' academic stress and its relation to their anxiety, time management, and leisure satisfaction. *American journal of health studies, 16,* 41-51.

Moore, S., Barbour, R., Ngo, H., Sinclair, C., Chambers, R., Auret, K., Hassed, C., & Playford, D. (2020). Determining the feasibility and effectiveness of brief online mindfulness training for rural medical students: a pilot study. *BMC Medical Education, 20(1),* 104. https://doi.org/10.1186/s12909-020-02015-6

Mori, S. C. (2000). Addressing the Mental Health Concerns of International Students. *Journal of Counseling & Development, 78(2),* 137-144. https://doi.org/10.1002/j.1556-6676.2000.tb02571.x

Morrison, R., & O'Connor, R. C. (2005). Predicting psychological distress in college students: The role of rumination and stress. *Journal of Clinical Psychology, 61(4),* 447-460. https://doi.org/10.1002/jclp.20021

Newman, M. G., Szkodny, L. E., Llera, S. J., & Przeworski, A. (2011). A review of technology-assisted self-help and minimal contact therapies for drug and alcohol abuse and smoking addiction: Is human contact necessary for therapeutic efficacy? *Clinical Psychology Review, 31(1),* 178-186. https://doi.org/https://doi.org/10.1016/j.cpr.2010.10.002

Nyklíček, I., & Kuijpers, K. F. (2008). Effects of Mindfulness-Based Stress Reduction Intervention on Psychological Well-being and Quality of Life: Is Increased Mindfulness Indeed the Mechanism? *Annals of Behavioral Medicine, 35(3),* 331-340. https://doi.org/10.1007/s12160-008-9030-2

O'Brien, G. (2002). Issues paper 3: A 'sense of belonging.' Retrieved from https://cms.qut.edu.au/__data/assets/pdf_file/0020/222590/first year experience paper developing a sense of belonging.pdf

O' Leary, K., & Dockray, S. (2015). The Effects of Two Novel Gratitude and Mindfulness Interventions on Well-Being. *The Journal of Alternative and Complementary Medicine, 21(4),* 243-245. https://doi.org/10.1089/acm.2014.0119

Ogden, J. (2017). The psychology of health and illness: an open access course.

Oman, D., Shapiro, S. L., Thoresen, C. E., Plante, T. G., & Flinders, T. (2008). Meditation Lowers Stress and Supports Forgiveness Among College Students: A Randomized Controlled Trial. *Journal of American College Health, 56(5),* 569-578. https://doi.org/10.3200/JACH.56.5.569-578

Ontario College Health Association. (2009). Towards a comprehensive mental health strategy: The crucial role of colleges and universities as partners. Ontario University & College Health Association. Retrieved from, http://oucha.ca/mental_health.php

Oswalt, S. B., & Wyatt, T. J. (2011). Sexual Orientation and Differences in Mental Health, Stress, and Academic Performance in a National Sample of U.S. College Students. *Journal of Homosexuality, 58(9),* 1255-1280. https://doi.org/10.1080/00918369.2011.605738

Park, T., Reilly-Spong, M., & Gross, C. R. (2013). Mindfulness: a systematic review of instruments to measure an emergent patient-reported outcome (PRO). *Quality of Life Research, 22(10),* 2639-2659. https://doi.org/10.1007/s11136-013-0395-8

Pearson, M. (2012). Building bridges: higher degree student retention and counselling support. *Journal of Higher Education Policy and Management, 34(2),* 187-199. https://doi.org/10.1080/1360080X.2012.662743

Poots, A., & Cassidy, T. (2020). Academic expectation, self-compassion, psychological capital, social support and student wellbeing. *International Journal of Educational Research, 99*. https://doi.org/10.1016/j.ijer.2019.101506

Peter, T., Roberts, L. W., & Dengate, J. (2011). Flourishing in Life: An Empirical Test of the Dual Continua Model of Mental Health and Mental Illness among Canadian University Students. *International Journal of Mental Health Promotion, 13(1),* 13-22. https://doi.org/10.1080/14623730.2011.9715646

Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior, 29(4),* 1841-1848. https://doi.org/10.1016/j.chb.2013.02.014

Regehr, C., Glancy, D., & Pitts, A. (2013). Interventions to reduce stress in university students: A review and meta-analysis. *Journal of Affective Disorders, 148(1),* 1-11. https://doi.org/10.1016/j.jad.2012.11.026

Renn, K. A. (2020). Success for LGBT College and University Students. In G. Crimmins (Ed.), *Strategies for Supporting Inclusion and Diversity in the Academy: Higher Education, Aspiration and Inequality* (pp. 183-200). Springer International Publishing. https://doi.org/10.1007/978-3-030-43593-6_10

Richards, D., & Richardson, T. (2012). Computer-based psychological treatments for depression: A systematic review and meta-analysis. *Clinical Psychology Review, 32(4),* 329-342. https://doi.org/10.1016/j.cpr.2012.02.004

Riordan, B. C., Cody, L., Flett, J. A. M., Conner, T. S., Hunter, J., & Scarf, D. (2020). The development of a single item FoMO (Fear of Missing Out) scale. *Current Psychology, 39(4),* 1215-1220. https://doi.org/10.1007/s12144-018-9824-8

Rosenzweig, S., Reibel, D. K., Greeson, J. M., Brainard, G. C., & Hojat, M. (2003). Mindfulness-Based Stress Reduction Lowers Psychological Distress In Medical Students. *Teaching and Learning in Medicine, 15(2),* 88-92. https://doi.org/10.1207/S15328015TLM1502_03

Ryan, R. M., & Deci, E. L. (2001). On Happiness and Human Potentials: A Review of Research on Hedonic and Eudaimonic Well-Being. *Annual Review of Psychology, 52(1),* 141-166. https://doi.org/10.1146/annurev.psych.52.1.141

Saravanan, C., & Wilks, R. (2014). Medical Students' Experience of and Reaction to Stress: The Role of Depression and Anxiety. *The Scientific World Journal, 2014*. https://doi.org/10.1155/2014/737382

Schaufeli, W. B., Martínez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and Engagement in University Students: A Cross-National Study. *Journal of Cross-Cultural Psychology, 33(5),* 464-481. https://doi.org/10.1177/0022022102033005003

Schultchen, D., Küchler, A.-M., Schillings, C., Weineck, F., Karabatsiakis, A., Ebert, D. D., Baumeister, H., & Pollatos, O. (2020). Effectiveness of a guided online mindfulness-focused intervention in a student population: Study protocol for a randomised control trial. *BMJ Open, 10(3)*. https://doi.org/10.1136/bmjopen-2019-032775

Seligman, M. (2011). Flourish: a visionary new understanding of happiness and well-being. *Policy, 27(3),* 60-61.

Shankar, A., Rafnsson, S. B., & Steptoe, A. (2015). Longitudinal associations between social connections and subjective wellbeing in the English Longitudinal Study of Ageing. *Psychology & Health, 30(6),* 686-698. https://doi.org/10.1080/08870446.2014.979823

Simmons, B. L. (2000). Eustress at work: Accentuating the positive. Unpublished doctoral dissertation, Oklahoma State University

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice-friendly meta-analysis. *Journal of Clinical Psychology, 65(5),* 467-487. https://doi.org/10.1002/jclp.20593

Smith, S. A. (2014). Mindfulness-Based Stress Reduction: An Intervention to Enhance the Effectiveness of Nurses' Coping With Work-Related Stress. *International Journal of Nursing Knowledge, 25(2),* 119-130. https://doi.org/10.1111/2047-3095.12025

Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. International Journal of Behavioral Medicine, 15(3), 194-200. https://doi.org/10.1080/10705500802222972

Speca, M., Carlson, L. E., Goodey, E., & Angen, M. (2000). A Randomized, Wait-List Controlled Clinical Trial: The Effect of a Mindfulness Meditation-Based Stress Reduction Program on Mood and Symptoms of Stress in Cancer Outpatients. *Psychosomatic Medicine, 62(5).*

Spek, V., Cuijpers, P. I. M., NyklÍČEk, I., Riper, H., Keyzer, J., & Pop, V. (2007). Internet-based cognitive behaviour therapy for symptoms of depression and anxiety: a meta-analysis. *Psychological Medicine, 37(3),* 319-328. https://doi.org/10.1017/S0033291706008944

Stallman, H. M. (2010). Psychological distress in university students: A comparison with general population data. *Australian Psychologist, 45(4),* 249-257. https://doi.org/10.1080/00050067.2010.482109

Ștefan, C. A., Căpraru, C., & Szilágyi, M. (2018). Investigating Effects and Mechanisms of a Mindfulness-Based Stress Reduction Intervention in a Sample of College Students at Risk for Social Anxiety. *Mindfulness, 9(5),* 1509-1521. https://doi.org/10.1007/s12671-018-0899-y

Stroebe, M., Van Vliet, T., Hewstone, M., & Willis, H. (2002). Homesickness among students in two cultures: Antecedents and consequences. *British Journal of Psychology, 93(2),* 147-168. https://doi.org/10.1348/000712602162508

Suldo, S. M., & Shaffer, E. J. (2008). Looking Beyond Psychopathology: The Dual-Factor Model of Mental Health in Youth. *School Psychology Review, 37(1), 52*-68. https://doi.org/10.1080/02796015.2008.12087908

Terneus, S. K. (2006). Problematic areas of practice in college counseling. Retrieved July 09, 2021, from http://counselingoutfitters.com/Terneus.htm

Thurber, C. A., & Walton, E. A. (2012). Homesickness and Adjustment in University Students. *Journal of American College Health, 60(5),* 415-419. https://doi.org/10.1080/07448481.2012.673520

Vago, D., & Silbersweig, D. (2012). Self-awareness, self-regulation, and self-transcendence (S-ART): a framework for understanding the neurobiological mechanisms of mindfulness [Review]. *Frontiers in Human Neuroscience, 6(296).* https://doi.org/10.3389/fnhum.2012.00296

van Ballegooijen, W., Cuijpers, P., Straten, A., Karyotaki, E., Andersson, G., & Smit, J. (2014). Adherence to Internet-Based and Face-to-Face Cognitive Behavioural Therapy for Depression: A Meta-Analysis. *PloS ONE, 9(7),* e100674. https://doi.org/10.1371/journal.pone.0100674

Wahbeh, H., Svalina, M. N., & Oken, B. S. (2014). Group, One-on-One, or Internet? Preferences for Mindfulness Meditation Delivery Format and their Predictors. *Open Medicine Journal, 1,* 66-74. https://doi.org/10.2174/1874220301401010066

Wang, X., Hegde, S., Son, C., Keller, B., Smith, A., & Sasangohar, F. (2020). Investigating Mental Health of US College Students During the COVID-19 Pandemic: Cross-Sectional Survey Study. *Journal of Medical Internet Research, 22(9),* e22817. https://doi.org/10.2196/22817

Wang, X., Zhang, D., & Wang, J.-L. (2011). Dual-Factor Model of Mental Health: Surpass the Traditional Mental Health Model. *Psychology, 2.* https://doi.org/10.4236/psych.2011.28117

Wentzel, J., van der Vaart, R., Bohlmeijer, E. T., & van Gemert-Pijnen, J. E. W. C. (2016). Mixing Online and Face-to-Face Therapy: How to Benefit From Blended Care in Mental Health Care. *JMIR Mental Health, 3(1).* https://doi.org/10.2196/mental.4534

Westefeld, J. S., Maples, M. R., Buford, B., & Taylor, S. (2001). Gay, Lesbian, and Bisexual College Students. *Journal of College Student Psychotherapy, 15(3),* 71-82. https://doi.org/10.1300/J035v15n03_06

Westerhof, G. J., & Keyes, C. L. M. (2010). Mental Illness and Mental Health: The Two Continua Model Across the Lifespan. *Journal of Adult Development, 17(2),* 110-119. https://doi.org/10.1007/s10804-009-9082-y

World Health Organization. (n.d.). Mental health: Strengthening our response. World Health Organization. Retrieved April 14, 2021, from https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response.

Zautra, A. J., Hall, J. S., & Murray, K. E. (2010). Resilience: A new definition of health for people and communities. In J. W. Reich, A. J. Zautra, & J. S. Hall (Eds.), *Handbook of adult resilience.* (pp. 3-29). The Guilford Press.

Zollars, I., Poirier, T. I., & Pailden, J. (2019). Effects of mindfulness meditation on mindfulness, mental well-being, and perceived stress. *Currents in Pharmacy Teaching and Learning, 11(10),* 1022-1028. https://doi.org/10.1016/j.cptl.2019.06.005

Appendices

Appendix A: Interview scheme

Interview

Introduction researcher

I am [name researcher] and I am a Health Sciences master student at the UT. Next to my studies, I am also working as a student assistant at the BMS Lab. This interview today is part of my master thesis as I am investigating the effectiveness and feasibility of the wellbeing course where you took part in the last four weeks and what can still be improved.

The interview will take in total around 45 minutes. During the interview, I would like to ask you different types of questions regarding your experience and opinion of the course so that I can get a better overview of the positive aspects and possible improvements for the future. If some of the questions should be unclear to you, do not hesitate to ask for an additional explanation of the question. There are no wrong answers, you can freely share your thoughts with me and I would really like to encourage you to talk openly about your experience and ideas.

The input of the interview and the informed consent will be separately stored and no one except the researchers of the UT will have access to the transcript of the interview. In the report of my master thesis, I will anonymize all your personal information. It is also your right to stop the interview at any time.

I would like to record the interview today so that I do not have to take notes constantly and can completely focus on our conversation. Afterward, I will create a transcript of the interview and anonymize it for further analyses. The recording of the interview will be deleted after I finished the transcript of the interview. Do you give your consent for making a recording of the conversation?

- *If yes:* Okay, then I will give you a short explanation of the structure of the interview.
- *If no:* Can you explain to me why? (Indicate that there is a possibility to talk with a fictional name)

Short explanation of structure

1. Background questions
2. Overall impression of the course

3. Opinion on topics and sessions
4. Implementation in the future
5. Closing

Do you have any questions so far?

Start recording of the interview

First of all, I would like to thank you already in advance to take part in this research. As far as I know, you just took part in a four-week-long online course about wellbeing, is that right?

…

<u>Person-related/background questions</u>

How old are you?

What do you study and how far are you in your studies?

What was your reason to join or take part in the course?

Did you have any experience ahead with meditation, mindfulness, or similar constructs?

If yes: what was your experience?

<u>Overall impression of the course</u>

Before taking part in the course…

- What did you expect from the online wellbeing course at the beginning?
    - If expectations: did the course fulfill your expectations?
        - Why?
- What do you think might be the benefits of participating in the online wellbeing course?
- What concerns did you have about participating in the online wellbeing course?
    - What were the main challenges or difficulties associated with participating in the online wellbeing course?

After taking part in the course…

- What do you think about the online wellbeing course in general?
- What is the most valuable aspect that you have learned throughout the course?

- What do you like about the course (and why)?
    - What did you find particularly interesting or surprising?
- What did you not like about the course (and why)?
    - What can we improve in terms of the structure of the course?
- What did you think about the topics overall?
    - What did you think about the order of the topics?
- What do you think about the two professionals who taught the course?
- What do you think about the amount of time you had to spent on the course?
    - Was it too much, suitable, or too little?
- What do you think about the duration of the course?
    - Was it too long, suitable, or too short?

If not explicitly talked about by participant, continue with

- What did you think about the micro-lectures?
- What did you think about the homework and exercises?
- What did you think about the online live sessions once a week?

- Would you like to add or change anything?

<u>Opinion on topics and sessions</u>

[share screen with participants to show them the content per topic again]

1. Topic
    a. What did you think about the first topic “What’s my story”?
    b. What grade would you assign the first week of the course, ranging from 1 very bad to 10 very good?
    c. Did you think that the first topic was of added value or relevant for yourself?
        i. Why or why not?
    d. What did you think about the additional exercises in the first week?
        i. Did you practice these exercises?
    e. What can we improve here (e.g. regarding content of the first week)?

2. Topic
    a. What did you think about the second topic “Silence and compassion as a method”?
    b. What grade would you assign the second week of the course, ranging from 1 very bad to 10 very good?
    c. Did you think that the second topic was of added value or relevant for yourself?
        i. Why or why not?
    d. What did you think about the additional exercises in the second week?
        i. Did you practice these exercises?
    e. What can we improve here (e.g. regarding content of the second week)?

3. Topic
    a. What did you think about the third topic “Where do I belong”?
    b. What grade would you assign the third week of the course, ranging from 1 very bad to 10 very good?
    c. Did you think that the third topic was of added value or relevant for yourself?
        i. Why or why not?
    d. What did you think about the additional exercises in the third week?
        i. Did you practice these exercises?
    e. What can we improve here (e.g. regarding content of the third week)?

4. Topic
    a. What did you think about the fourth topic “What is my wellbeing”?
    b. What grade would you assign the fourth week of the course, ranging from 1 very bad to 10 very good?
    c. Did you think that the fourth topic was of added value or relevant for yourself?
        i. Why or why not?
    d. What did you think about the additional exercises in the fourth week?
        i. Did you practice these exercises?
    e. What can we improve here (e.g. regarding content of the fourth week)?
    f. Would you like to add or change anything?

Implementation questions

- What did you think about the online course being guided by two professionals?
    - Would you prefer a course with or without guidance?
- How should the course look like in the future? – covid 19
    - Do you think that offline and online lessons should be integrated?
        - Why? / Why not?
- What do you think about the course being offered via Canvas?
    - Would you prefer a different medium?
        - For example, a different website, blog, forum, video's/vlog, app, test/survey, game, chat
- What do you think about the layout and aesthetics of the course?
    - What grade would you assign the layout and aesthetics?
- What do you think about the ease of use of the course?
    - What grade would you assign the ease of use?

Closing questions

- If you would have to assign the overall course a grade between 1 and 10, with 1 being very bad and 10 being very good, which grade would you give it?
    - Why?
- Would you participate in this or a similar course in the future (e.g. regular meditation sessions)?
- Would you recommend this course to other students?
    - Why? / Why not?
- Do you think that other people in your environment would participate in such a course if it would be offered, for instance, once a year?
    - Why? / Why not?

End of the interview

This is the end of this interview. Would you like to add or change anything?

Thank you for your participation.

Appendix B: Screenshots of the online wellbeing course

Week 1

No Books Course on Well-Being - Week 1, What's my Story

This week is about passions, in your current life, and in the past.

Watch this week's video, and do the exercise here.

Additional exercises

A full version of the tracking-exercise from the week-video is available here. Take a moment, and dive a little deeper into what your passions are, and where and when they emerged.

This video can help you maintain a balanced and more silent state. Take a pause during the day, when you feel you're moving on 'automatic pilot' by using the three steps of the 3-minute breathing space:
- Step 1. Check your body position, take an alert, relaxed and upright body position with an open chest, and notice your current state, thoughts, emotions.
- Step 2. Bring your attention to your breath, and notice a few of your in- and exhalations.
- Step 3. Widen your attention to take in the whole body, thoughts and emotions again; and simply notice your current state.

The 3-minute breathing space - although a little longer than 3 minutes, this video guides you through the steps. Once you got it, you can use it at any time during the day. It can also serve well before you go to sleep or after waking up before you get up.

Bonusvideo: A short Gratitude exercise.

Who do you admire?

To better understand what you value, it can help to turn to real-life examples of people who exhibit admirable qualities. Think of some positive role models who inspire you to live a meaningful life.

This could include people you know personally, famous figures, characters in a book, etc.

As you think about these people, write down:

- what it is about them that inspires you
- the admirable qualities they possess
- behaviors and actions you would like to emulate

Sparkling moment

Close your eyes. Reflect on a sparkling moment in recent days. What moment comes to mind first? Where were you, with whom, what do you feel about it, what are your thoughts? Can you relive the situation and do you feel the sparkle again? Which values underlie this moment?

Take a daily mini-holiday

Let's go on vacation every day. Get out of the rat race and take a mini break in the day, a mini-holiday. Every day we choose where we go. For example: take a walk, talk to a friend, take a hot bath, watch the sunrise, make a nice tea. Time to relax. Just put the worries aside and enjoy a small "mini-holiday" during the day. And then reflect on the positive emotions you experience. Take a moment to name them and possibly write them down. After your mini-holiday, it's time to resume your day.

Ready for another mini-holiday... What would it be?

Inspiration:

- Franquesa, A., Cebolla, A., García-Campayo, J. *et al.*Meditation Practice Is Associated with a Values-Oriented Life: the Mediating Role of Decentering and Mindfulness. *Mindfulness* **8,** 1259–1268 (2017). https://doi.org/10.1007/s12671-017-0702-5
- 9 Attitudes Jon Kabat Zinn: which postures can I practice for this course?

https://www.youtube.com/watch?v=2n7FOBFMvXg

- **Poem**

"Important"

"We hurry through the so-called boring things
in order to attend to that which we deem
more important, interesting.
Perhaps the final freedom will be a recognition that
everything in every moment is "essential"
and that nothing at all is "important."

By Helen M. Luke

Week 2

No Books Course on Well-Being - Week 2, Silence and compassion as a method

This week is about silence and compassion.

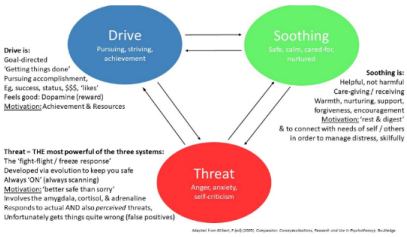
Watch this week's video, and do the exercise here.

Additional exercises

Use this video to do the body scan.

Have a look at the exercises below, and pick one every day to gain more insight into compassion for the other and for yourself.

Exercise 1:



Which system do you use most often? Can you write your observations of the three systems down and reflect on your notes? Is there a balance between the three systems?

We often live in the drive system, or the threat system, wanting, striving or pushing and fearing. There are at high costs when we are primarily driven by the "old brain" threat system or an 'out of control' drive system. Our newer brain has the unique capacity to know that it knows. It allows us to think and to know that we think, to feel and to know that we feel. Our newer brain allows us to develop insight and insight enables us to take some responsibility, and step aside from the 'old brain' automatic thoughts. The old brain is so quick and automatic, and our challenge is to get to know it better. To do this, we need our newer brain.

Exercise 2: How would you treat a friend?

Please take a sheet of paper and answer the following questions:

1. First, think about times when a close friend feels really bad about him or herself or is really struggling in some way. How would you respond to your friend in this situation (especially when you're at your best)? Please write down what you typically do, what you say, and note the tone in which you typically talk to your friends.
2. Now think about times when you feel bad about yourself or are struggling. How do you typically respond to yourself in these situations? Please write down what you typically do, what you say, and note the tone in which you talk to yourself.
3. Did you notice a difference? If so, ask yourself why. What factors or fears come into play that lead you to treat yourself and others so differently?
4. Please write down how you think things might change if you responded to yourself in the same way you typically respond to a close friend when you're suffering.

Exercise 3: Self-Compassion Break (when your drive / danger system is very active)

Think of a situation in your life that is difficult, that is causing you stress. Call the situation to mind, and see if you can actually feel the stress and emotional discomfort in your body.

Now, say to yourself:

1. **This is a moment of suffering**

That's mindfulness. Other options include:

- This hurts.
- Ouch.
- This is stress.

2. **Suffering is a part of life**

That's common humanity. Other options include:

- Other people feel this way.
- I'm not alone.
- We all struggle in our lives.

Now, put your hands over your heart, feel the warmth of your hands and the gentle touch of your hands on your chest. Or adopt the soothing touch you discovered felt right for you.

Say to yourself:

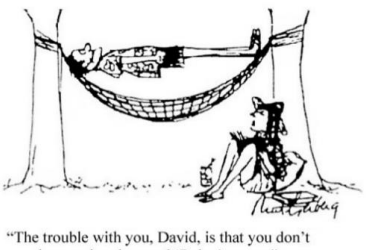
3. **May I be kind to myself**

You can also ask yourself, "What do I need to hear right now to express kindness to myself?" Is there a phrase that speaks to you in your particular situation, such as:

- *May I give myself the compassion that I need*
- *May I learn to accept myself as I am*
- *May I forgive myself*
- *May I be strong.*
- *May I be patient*

This practice can be used any time of day or night, and will help you remember to evoke the three aspects of self-compassion when you need it most.

Video tip: Self Compassion Exercise: https://www.youtube.com/watch?v=-kfUE41-JFw



"The trouble with you, David, is that you don't know what the word 'Relax' means."

Week 3

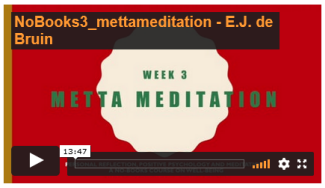
No Books Course on Well-Being - Week 3, Where do I belong

Where do I belong.

Watch this week's video, and do the exercise here.

Additional exercises

Use this video to do the metta meditation as presented in the weekvideo.



Have a look at the following exercises, maybe there is something helpful for you...

Self compassion meditation (Kristin Neff):

https://self-compassion.org/wp-content/uploads/2020/08/LKM.self-compassion_cleaned_01-cleanedbydan.mp3

Exercise: Self-Compassion Journal (Kristin Neff).

Try keeping a daily self-compassion journal for one week (or longer if you like.) Journaling is an effective way to express emotions, and has been found to enhance both mental and physical well-being. At some point during the evening when you have a few quiet moments, review the day's events. In your journal, write down anything that you felt bad about, anything you judged yourself for, or any difficult experience that caused you pain. (For instance, perhaps you got angry at a waitress at lunch because she took forever to bring the check. You made a rude comment and stormed off without leaving a tip. Afterwards, you felt ashamed and embarrassed.) For each event, use mindfulness, a sense of common humanity, and kindness to process the event in a more self-compassionate way.

Mindfulness

This will mainly involve bring awareness to the painful emotions that arose due to your self-judgment or difficult circumstances. Write about how you felt: sad, ashamed, frightened, stressed, and so on. As you write, try to be accepting and non-judgmental of your experience, not belittling it nor making it overly dramatic. (For example, "I was frustrated because she was being so slow. I got angry, over-reacted, and felt foolish afterwards.")

Common Humanity

Write down the ways in which your experience was connected to the larger human experience. This might include acknowledging that being human means being imperfect, and that all people have these sorts of painful experiences. ("Everyone over-reacts sometimes, it's only human.") You might also want to think about the various causes and conditions underlying the painful event. ("My frustration was exacerbated by the fact that I was late for my doctor's appointment across town and there was a lot of traffic that day. If the circumstances had been different my reaction probably would have been different.")

Self-Kindness

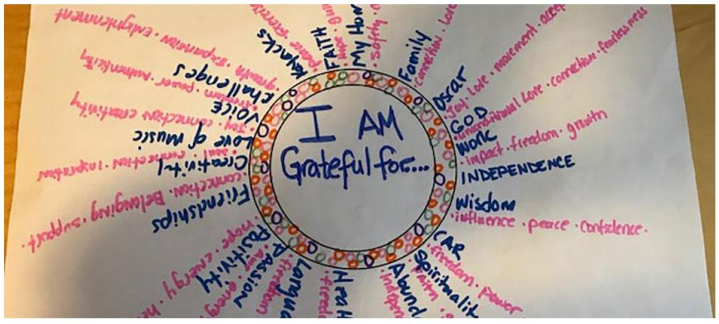
Write yourself some kind, understanding, words of comfort. Let yourself know that you care about yourself, adopting a gentle, reassuring tone. (It's okay. You messed up but it wasn't the end of the world. I understand how frustrated you were and you just lost it. Maybe you can try being extra patient and generous to any wait-staff this week...")

Practicing the three components of self-compassion with this writing exercise will help organize your thoughts and emotions, while helping to encode them in your memory. If you keep a journal regularly, your self-compassion practice will become even stronger and translate more easily into daily life.

When your world moves too fast
and you lose yourself in the chaos,
introduce yourself
to each color of the sunset.
Reacquaint yourself
with the earth beneath your feet.
Thank the air that surrounds you
with every breath you take.
Find yourself
in the appreciation of life.

-Christy Ann Martine

Make a gratitude Mandala or Mindmap to remind yourself to the good parts of your life.



Week 4

No Books Course on Well-Being - Week 4, What is my well-being

What is my well-being .

Watch this week's video, and do the exercise here.

Additional exercises

Use this video to do the exercise as presented in the weekvideo.

Have a look at the exercises below, and pick one when the mood strikes - the variety may help you maintain a regular practice, or help you find and discover other practices!

Remember the blue sky!

https://www.youtube.com/watch?v=56c1uL_O8Jk

There are some simple steps you can take to help start and maintain a healthy meditation practice.

1. **Link Meditation to a Habitual Activity**

Activities such as showering, brushing teeth, or driving home from work are deeply ingrained habits that don't require effort or forethought. They are known as instrumental tasks. By linking your meditation to one of these tasks, the effort needed to initiate the meditation session is significantly reduced.

2. **Start Small**

Meditate for short periods of time, in which you experience no resistance. For instance, you might start with just 10 minutes. It should be easily attainable and create absolutely no push back from your mind. Establishing the habit of meditation is much more important than increasing the length of time spent in meditation. Once your initial time commitment becomes habitual, you can then begin to lengthen your meditation practice.

3. **Experiment with Guided Meditations**

New meditators are often not sure what to do during a meditation. Guided meditations are an excellent way to settle into this practice. Guided meditations will lead you through breathing techniques, relaxation, and visualization, mantra, or mindfulness-based practices. This takes all the guesswork out of your meditation and can help you free your mind and surrender to the experience.

4. **Attend a Group Meditation**

Meditation is an individual activity. That doesn't mean group meditations can't be beneficial. Meditating with others can reinforce your personal commitment to the practice and provide access to a huge reservoir of knowledge. Groups can create a tangible energy that can inspire even the most reluctant meditator. Studies show that meditating in groups can increase peace in your community.

5. **Use an App**

Who says you have to turn off your smartphone during meditation? While you should refrain from checking emails and texts or taking calls, there are a variety of apps that can actually enhance your meditation.

Buddhify-app **Head Space**

Smiling Mind **Calm**

Meditation Helper **Stop, Breathe & Think**

6. **Schedule Your Meditation**

If meditation is not on your schedule, it's easier to put other activities and tasks ahead of this important practice. Sometimes just seeing the word "meditation" penciled onto your calendar can be enough of an incentive to show up for this daily dose of peace.

In an accomplishment-oriented culture, schedules can fill up to the point that there is little time left for the activities and pursuits that really matter. By scheduling meditation, you make sure that nothing will interfere with your commitment to yourself. If possible, schedule meditation at the same time each day. Your body and mind will eventually begin to relax as that time draws near.

7. **Create a Meditation Space**

Carve out a little corner of your room to use exclusively for meditation. In that corner, place your meditation seat of choice such as bolsters, blankets, or any props that you need to support yourself. Then fill your space with objects that inspire you such as photos, soft lighting, candles, incense, a diffuser, sacred books, or anything else that speaks to your soul. Use this space only for meditation. It will absorb the vibrations of calmness. Eventually, just entering your sacred space will initiate the relaxation response.

Books

The Miracle Of Mindfulness, Thich Nhat Hanh

The Headspace Guide To Meditation & Mindfulness, Andy Puddicombe

Start Where You Are, Meera Lee Patel

Appendix C: Informed Consent

Welcome!

Thank you already in advance for participating in the pilot test. The first questionnaire that you will fill in today should take around 25 minutes in total to complete. By filling in your student email address in the following questions I can ensure that you will be added to the online Canvas course. By filling in your SONA number I can record whether you completed all parts of the pilot test, if you want to retrieve SONA points in the end.

Throughout the online Canvas course, you will watch one online lecture per week and complete some exercises as a preparation for the weekly live session. Each week a different topic will be tackled and one week after each topic you will fill in a short questionnaire. Please note: it is important that you mark the online lectures with a check mark as done on Canvas and attend the live sessions. After you have completed the four weeklong online course, I would like to ask you to fill in one more questionnaire that takes around 25 minutes for completion. Again, you are asked to fill in your student email address and SONA number so that I can record your progress and assign you your points. After I assigned your SONA points, I will remove your email address and SONA number from the dataset. Optionally, you can also participate in an interview session after the course for which you can receive additional SONA points. To participate, you will have to sign up once again via SONA.

Informed consent for the questionnaire/online course

There are no right or wrong answers to any of the tasks or questions of the pilot study, including the online course. Please be assured that your responses will be kept completely confidential. If your research results are to be used in scientific publications or made public in any other manner, then they will be made completely anonymous. Your personal data will not be disclosed to third parties without your express permission. Your participation in this research is voluntary. You have the right to withdraw this consent at any time during the pilot study and without the need to give any reason. If you request further information about the research, now or in the future, you may contact Lea Berkemeier, l.berkemeier@student.utwente.nl.

If you have any complaints about this research, please direct them to the secretary of the

Ethics Committee of the Faculty of Behavioural, Management and Social Sciences at the University of Twente, Drs L. Kamphuis-Blikman P.O. Box 217, 7500 AE Enschede (NL), telephone: +31 (0) 53 489 3399; email: l.j.m.blikman@utwente.nl

By clicking the button below, you acknowledge that your participation in the study is voluntary, that you are at least 18 years old, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

- I consent, begin the pilot study
- I do not consent, I do not wish to participate

Appendix D: Email sent to senior Psychology students

Dear student,

Do you sometimes feel disconnected, a lack of motivation, or are you feeling kind of lost in your academic or personal life? Then this is the course that will help you improve in these areas of your life!

We developed an online course that is based on positive psychology and mindfulness, which can support you! During the course we focus on how to increase motivation, connect to your environment, friends, peers and co-students, and most importantly, you will learn how to take care of your well-being. The approach in the course is very interactive and practical: you will gain further insights through short videos, guided exercises and even weekly live sessions via the Canvas page designed for this course. The live sessions will take place on the following dates:

- Thursday 3 June 20.00 - 21.00 hrs
- Thursday 10 June 20.00 - 21.00 hrs
- Thursday 17 June 20.00 - 21.00 hrs
- Thursday 24 June 20.00 - 21.00 hrs

The course is also connected to the research conducted by a Health Sciences master student. If you would like to take part it is important that you fill in the first part of the study this week. You can do so via the Qualtrics link below. After you have filled in the first questionnaire, you will be added this week to the online Canvas course. The course will start from next week Monday (31 May) onwards. If you have any questions left or only want to participate in the course but not in the research, feel free to send an email to [email researcher].

[link to survey]
We are looking forward to welcoming you!

Best wishes,
[name teachers and researcher]

Appendix E: Announcement for first-year Psychology students

Dear students,

As mentioned in the introduction lecture, you can find here once again the link to sign up for my study on SONA.

Online wellbeing course for first-year Psychology students

If you want to participate in the online wellbeing course, it is important that you sign up this week via SONA and also fill in the first part of the study. After you have filled in the first questionnaire, I will add you this week to the online Canvas course. The course will start from next week Monday (26th of April) onwards. If you have any questions left, feel free to send me an email ([email researcher]).

It would be amazing to see many of you participating in the study and the course, I really look forward to it.

Good luck with the fourth module of Psychology!

Best,

[name researcher]

Appendix F: Overview of all main and sub codes

Main code	Sub code
Participant characteristics	Reason to participate
	Experience
Personal experiences	Added value
	Amount of time
	Duration
Impressions of the course	General
	(Additional) exercises
	Structure
	Micro-lectures
	Live sessions
	Teachers
	Design
	Medium
	Ease of use
Course in the future	Improvements
	Guidance
	Setting
	Participation
Other	Expectations
	Benefits
	Concerns
	Recommendation to others

Appendix G: Overview of wellbeing means and standard deviations measured with the Mental Health Continuum Short Form (MHC-SF)

	n	*M*	Min	Max	Range	*SD*
Before						
Wellbeing	49	2.54	0.50	4.64	0-5	1.05
Emotional	49	2.86	0.67	5	0-5	1.13
Social	49	2.08	0.40	4.60	0-5	1.11
Psychological	49	2.77	0.33	5	0-5	1.17
During						
Wellbeing	49	2.72	0	4.57	0-5	0.96
Emotional	49	2.96	0	5	0-5	1.11
Social	49	2.38	0	4.40	0-5	1.07
Psychological	49	2.89	0	4.83	0-5	0.99
After						
Wellbeing	49	2.76	0.71	5	0-5	0.97
Emotional	49	3.02	0.67	5	0-5	1.09
Social	49	2.36	0.20	5	0-5	1.16
Psychological	49	2.96	0.67	5	0-5	1.05