A pilot study on the effectiveness of a positive psychology app in increasing well-being and self-compassion

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Abstract

This pilot study aimed at assessing the effectiveness of the newly developed Dutch smartphone application called Training in Positivity (TIP) in increasing general mental well-being as well as self-compassion. Students of the University of Twente and Saxion participated in the research and tested the app for a total of 18 days. Before and after using TIP, participants filled in a questionnaire that assessed different aspects of their mental well-being. In total, the data of 67 participants could be used to evaluate whether the app use positively impacted the student's well-being and self-compassion. The students were recruited either by their teacher or via SONA, a platform that gives students credits for completing studies. Analysis of the data showed slight but not significant increase in the well-being score of participants (B= 1.13, t= .51, p>.05) as well as a slight non-significant increase in the self-compassion score (B= .54, t= .44, p>.05). Several limitations such as the small sample size, the high drop-out rate, and the fact that not all students finished the app, limit the generalizability and reliability of the results. Therefore, more research on a wider population is needed to evaluate whether the effect of the app is indeed not significant.

1. Introduction

1.1 Barriers to mental health treatment

Nowadays an increasing number of people are suffering from mental health problems and reduced well-being. The measures that were taken due to the pandemic have significantly impacted the well-being of many people in a negative way (Ivbijaro, 2020). The lockdown due to COVID-19 has led to many financial problems and a different work-life routine which triggered negative feelings such as anxiety, loneliness, and fear and therefore increased the number of people with a need for therapy (Ivbijaro, 2020). Due to this, the waiting time for an appointment with a psychologist has become even longer and even mental health patients with severe symptoms can often not receive timely treatment (Sweet, 2021).

Besides the unavailability of therapists, various other reasons can prevent a person who experiences mental health issues from seeking professional help. A considerable number of individuals experience fear to seek therapy due to a stigmatisation in society (Andrade et al., 2013; Eisenberg et al., 2009; W, et al., 2007). Moreover, a high percentage of individuals have the desire to solve mental health related issues on their own (Andrade et al., 2013). Another common reason why people with mental health disorders do not visit a therapist is the lack of perceived need for treatment (Andrade et al., 2013). This especially accounts for individuals who only experience mild or moderate symptoms but also represents a common reason against therapy in individuals with severe symptoms (Andrade et al., 2013). Additionally, to these barriers resulting from negative attitudes toward therapy, people from low-income families in the United States report a lack of financial resources as a reason to not seek treatment (Sareen, et al., 2007). Therefore, it is important that individuals are provided with alternative affordable and instant interventions to help them improve their mental health independently.

1.2Mental health

When defining mental health, the focus used to be solely on the absence of mental illnesses (Westerhof & Keyes, 2010). Mental health, however, includes far more aspects than simply the absence of mental illnesses such as depression. The World Health Organization incorporates these aspects in their definition of *mental health* and defines it as the following: "Mental health is a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively, and is able to make a contribution to his or her community" (World Health Organization, 2004, p. 2).

Furthermore, the two continua model states that mental health and mental illness are different but related phenomena (Westerhof & Keyes, 2010). Westerhof and Keyes (2010) argue that positive mental health consists of the three dimensions emotional, psychological, and social well-being. Emotional well-being includes interest in life, happiness, and satisfaction. Moreover, psychological well-being consists of the six elements self-acceptance, purpose in life, autonomy, positive relations with others, environmental mastery, and personal growth. The third dimension, social well-being is composed of five subdimensions: social coherence, social acceptance, social actualization, social contribution, and social integration. This dimension can be used to evaluate whether someone is optimally functioning in society. A person that displays high levels of emotional and optimal levels of psychological and social well-being can be considered flourishing (Westerhof & Keyes, 2010). In opposite to that, a person with low levels in all three dimensions is referred to as being languishing.

1.3 Positive psychology

One psychological approach that focuses on positive aspects of a person's life to increase and maintain the mental well-being of the individual is positive psychology. Positive psychology focuses on the strengths and positive attributes of a person instead of fixating on

problems and weaknesses (Kobau, 2011). When examining exercises and concepts that are used in positive psychology as well as the approach itself, research has mostly come to similar positive results. A landmark study about the effectiveness of positive psychology was conducted by Seligman et al. (2005). The researchers discovered that Positive Psychology Exercises (PPEs) such as the three good things exercise, which entails writing about three good things that happened during the day, positively influence symptoms of depression and can increase happiness.

As positive psychology grew in popularity various studies examining the effectiveness of positive psychology interventions were conducted. Lambert, et al. (2019) found a positive effect of a positive psychology intervention on the well-being of university students. Bolier, et al. (2013) conducted a meta-analysis of the literature that deals with various positive psychology interventions in a general non-clinical population. The researchers came to the conclusion that the interventions overall positively influenced the mental health of individuals to a low but significant, or a moderate amount. Furthermore, their analysis showed that positive psychology interventions have the potential of decreasing depressive symptoms in individuals. A meta-analysis by Chakhssi, et al. (2018) confirms these results in a clinical sample. In the analysis of 30 studies, a small significant effect of positive psychology interventions on well-being, depressive symptoms, and anxiety was found.

A meta-analysis by Hendriks, et al. (2020) shows the same results as Chakhssi, et al. (2018) and Boiler, et al. (2013). Hendriks et al. (2020) performed a meta-analysis on a total of 50 studies that were conducted among clinical and non-clinical populations. Just as the previously conducted meta-analyses, they concluded that PPIs positively effects well-being and depression but mention that more well-conducted research would be necessary to strengthen these findings. Therefore, it can be concluded that positive psychology exercises

and interventions seem to positively affect the subjective and psychological well-being in clinical as well as non-clinical populations.

1.4 Self-compassion

One aspect that can be part of these PPIs and potentially increase mental well-being by contributing to a positive attitude toward oneself is self-compassion (Neff, 2003). A possible definition of *self-compassion* was proposed by Neff (2003) who defined it as

> being touched by and open to one's own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one's suffering and to heal oneself with kindness. Self-compassion also involves offering non-judgmental understanding to one's pain, inadequacies and failures, so that one's experience is seen as part of the larger human experience. (p. 87).

A meta-analysis by MacBeth and Gumley (2012) showed that self-compassion can positively influence depressive symptoms, anxiety, and well-being.

Different theories can be used to explain this connection between self-compassion and well-being. First of all, self-compassion could influence goal setting as well as facilitate the achievement of goals by mitigating the negative emotions experienced when facing a setback or failure (Leary et al., 2007; Zessin et al., 2015). The achievement of goals in turn leads to higher well-being according to goal theories (Zessin et al., 2015). Generally, self-compassion is associated with higher emotional resilience which enables a person to cope better with positive and negative life events (Leary et al., 2007). It might therefore be beneficial to include exercises that aim at increasing self-compassion in a positive psychology intervention. A possible exercise that could be included to increase self-compassion is to write about a distressing event that happened that day. This exercise was shown to decrease depressive symptoms and increase happiness (Shapira & Mongrain, 2010). To ensure that many individuals have the opportunity to benefit from such an intervention it is important to

make it easily accessible while overcoming the mentioned barriers to clinical-based care.

1.5 Smartphone applications for mental well-being

One possibility to make positive psychology interventions accessible for a wide range of people is creating web-based interventions such as an application that is designed for the smartphone. Smartphone apps can have several advantages and might be used to overcome some of the described barriers that keep individuals from seeking and receiving therapy. An application offers people the opportunity to improve their well-being when and wherever the person prefers while making little effort and investing only a short amount of time (East & Havard, 2015). As apps are mostly free or cheap even members of low-income families are able to make use of this form of intervention (East & Havard, 2015). Since mental health apps mostly introduce the user to self-help exercises, these apps can be suited for individuals who would like to address the problem on their own (Neary & Schueller, 2018).

Moreover, the fear of being stigmatized is reduced if not diminished and individuals do not need to wait until being able to access the intervention (Neary & Schueller, 2018). Ben-Zeev et al. (2018) compared the effectiveness of a smartphone application with a clinical based intervention among patients with clinical disorders and found that the application resulted in greater engagement of participants while achieving the same positive clinical outcomes as the clinical based intervention. Additionally, to being more engaged during the interventions, individuals introduced to the app were more likely to start treatment.

An example of a well-researched mental-health app is IntelliCare which consists of a combination of different apps. Each of these apps focuses on a single skill such as goal setting which is connected to anxiety or depression (Mohr, et al., 2017). A study conducted by Mohr et al. (2017) indicates that the app significantly decreases symptoms of depression and anxiety. A meta-analysis by Linardon, et. al. (2019), in which 66 studies that examined mental health apps were analysed, suggests that other mental health apps achieve similar

positive results. Their analyses showed that apps can have a positive impact on several mental health problems such as depression. Furthermore, a meta-analysis of randomized control trials by Linardon (2020) showed that smartphone apps can potentially increase the self-compassion level of users, but more research is needed to draw firm conclusions.

Even though various mental health apps exist, only few of them are specifically based on positive psychology. Coelhoso et al. (2015) assessed the effectiveness of a well-being app that was designed for working women and based on positive psychology, breathing techniques, relaxation training, and guided meditation. A positive effect on general well-being was found in the control as well as in the experimental group, but only the participants that used the app experienced a significant increase in work related well-being as well as a reduction in stress.

Moreover, Marshall, et al. (2020) conducted a systematic app store review of positive psychology mobile applications and could identify a total of 34 apps that claimed to be interventions grounded in positive psychology. Of these 34 apps only three, namely MoodHacker, Happify and SuperBetter, were backed up by research and resulted in a reduction of depressive symptoms as well as improvements in other mental-health symptoms such as anxiety (Birney et al., 2016; Parks et al., 2018; Roepke et al., 2015). MoodHacker and SuperBetter were tested among participants with depressive symptoms and Happify was tested with new users of the app regardless of depressive symptoms (Birney et al., 2016; Parks et al., 2018; Roepke et al., 2015). However, these smartphone apps are not solely based on positive psychology but additionally grounded on cognitive-behavioural therapy (CBT). Due to this, the aspects of the apps that are based on findings of positive psychology might not account for the positive effect found in the studies. Therefore, seemingly not many smartphone applications, whose efficacy was confirmed by research and that are purely based on findings of positive psychology, exist.

1.6 The present study

Even though research has already shown the beneficial effects of positive psychology interventions, more research in different cultures and populations is needed to confirm these results (Bolier, et al. (2013). So far, not many studies examined the effectiveness of a positive psychology app in a student population, and apps that make use of PPEs are not broadly researched yet. For this reason, this study is going to assess the impact of a newly developed app called Training in Positivity (TIP), which makes use of a combination of different positive psychology exercises, on the well-being and self-compassion of university students. Additionally, it will be assessed whether the students had any difficulties while using the app that might influence the results of this study. Furthermore, differences between males and females will be considered. Based on the above-described research about the effectiveness of mental health apps as well as positive psychology interventions it is hypothesized that the app will significantly increase the overall mental well-being and self-compassion of university students after 18 days of daily interaction with TIP.

2. Methods

2.1 Design

For the study a quasi-experimental and within participants design with a pre- and post-test was used. No control group was created which means that the participants were not randomly assigned to one group, but all participated in the experimental condition. The well-being and self-compassion of participants was assessed by evaluating the mental health questionnaires which included indications for the general mental health as well as the self-compassion score of the participants. The independent variable time was used to differentiate between the pre- and post-questionnaires which enabled comparison between the two. The two dependent variables were well-being and self-compassion.

2.2 Participants

In total 67 students, 22 males and 45 females participated in the study but only 32 students completed the post-questionnaire. The students of the University of Twente were recruited through a SONA system which grants students credit that is needed to successfully complete their studies. Every student needs to achieve a total of fifteen credits to be able to graduate successfully. For participating in this research, the students were granted 2.5 credits. Students at the Saxion completed the study as part of a class and were therefore recruited in the classroom. Only students that were a least 18 years old, able to understand and write Dutch, and studied at the University of Twente or Saxion were included in the study. To be able to participate the students had to be in the possession of a smartphone with which the app TIP could be downloaded, and the questionnaire be filled in. Moreover, the students needed daily access to the internet to be able to use the app every day. The age of the participants ranged from 18 to 30 with a mean of 21.19 (*SD*=2.39). Overall, 69.6% of the participants were Dutch and 30.4% had a different nationality such as German.

2.3 Materials

The application and the questionnaire as well as all additional material were only available in Dutch. Emails containing information about the study as well as the download instructions and download code of the relevant application were created and sent to all participants (Appendix A). The questionnaire was created and published via Qualtrics and consists of 12 main parts. Before answering the main questions, the participants were asked to give their participant number and agree to the informed consent that could be accessed via a linked website (Appendix B). The participant number was needed to match the data of the pre-questionnaire with the data of the student in the post-questionnaire. Afterwards information on the type of questions following and how to fill in the questionnaire were given. In the following section ‘general questions’ participants had to indicate, amongst other

demographic questions, their age, gender, living situation, country of residence, country of origin as well as the parent's country of origin.

The next section included seven questions that assessed how COVID-19 impacted the life of the participant. An example of a question is "which consequences of the pandemic do you experience to be negatively affecting your well-being?". Afterwards one section aimed at assessing the general well-being of the participants using the Mental Health Continuum-Short Form (MHC-SF) which includes questions such as "In the past month how often did you feel that you were happy" and "In the past month how often did you feel that your life has a direction or meaning". Another section included questions of the Self-Criticizing/ Attacking & Self-reassuring Scale (FSCRS) that aim at assessing the level of self-compassion. An example of a question is "When something goes wrong in my life I can easily forgive myself".

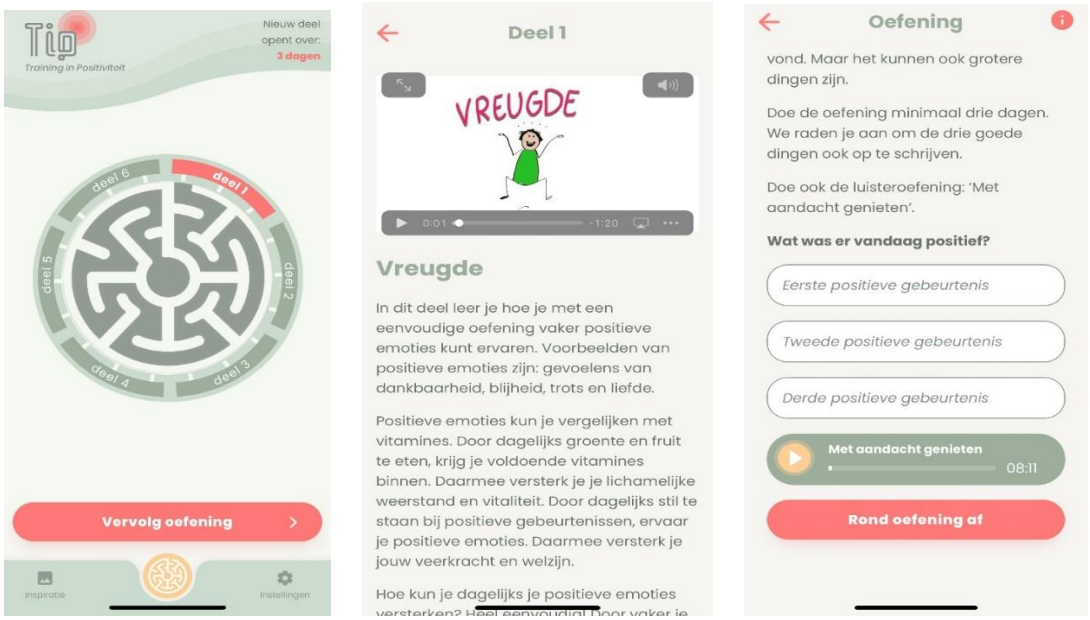
Additionally, the students were required to answer questions assessing the level of anxiety, spiritual well-being, self-efficacy, ability to adapt, positive revaluation, depressive complaints, savoring, and rumination. These sections are however not relevant to this specific study, but the data is used by other researchers. In the end the participants were given the opportunity to write questions down. The post-questionnaire was built almost entirely identical but further entails a section with 39 questions such as "What do you think of the quality of TIP?" with which the participant evaluates the app.

After completing the first questionnaire the participants were expected to download the app TIP. TIP is a recently developed app based on principles and exercises of positive psychology that had not been tested and is not available to the public yet. Currently the app is only available in Dutch and no other languages. When opening the app, a labyrinth is shown that consists of six parts the user has to complete (Figure 2, screenshot 1). The different parts that are needed to complete the labyrinth are happiness, confidence in yourself, confidence in

the future, friendliness, resilience, and affiliation. Every part consists of a video that introduces the concept and topic to the user, a text with further explanation as well as different exercises that are related to the topic such as the three good things exercise (Figure 2, screenshots 2 and 3). Each part takes three days in total to be completed and the user is asked to complete short questionnaires in the app before and after each topic that assesses to which level the user displays the specific characteristic. Additionally, the user is provided with motivational feedback following an exercise and can further access inspirational quotes independently of the exercises. After three days, the next topic is introduced. Daily reminders are sent to the users, unless turned off, to prevent that TIP is forgotten.

Figure 2

Screenshot 1 *Screenshot 2* *Screenshot 3*



2.4 Measures

Well-being

To assess the well-being of participants in the questionnaire, the Dutch version of the MHC-SF was used. The MHC-SF consists of 14 items with answer options ranging from 0

'never' to 6 'everyday', which focus on social, psychological, and emotional well-being (Lamers et. al., 2011). Based on the self-report questionnaire it can be determined whether a person is flourishing, displaying moderate mental health or languishing. A person that is flourishing displays high levels of well-being, whereas a person with a moderate level of well-being is neither flourishing nor languishing, while languishing describes the absence of well-being (Luijten et al., 2019). In general, higher scores in the Likert-scale represent higher well-being which is why only an overall score was used in this research. The MHC-SF was shown to be reliable with a test-retest reliability of .65 after nine months, and valid when assessing dimensions of well-being in the Dutch population (Lamers et. al., 2011; Luijten et al., 2019). The internal consistency of the scale is high with $\alpha = .91$(Luijten et al., 2019).

Self-compassion

Forms of the FSCRS, which was originally developed by Gilbert et al. (2004), were used to measure the self-compassion of the participants. The FSCRS measures the three concepts inadequate self, reassured self and hated self and consists of a total of 22 questions (Baião et. al., 2015). In this research only the eight questions belonging to the subscale 'reassured-self' were used after being translated into Dutch. As the subscale focuses on the ability of a person to forgive the self, it was used to assess the self-compassion of the students. Each question can be rated on a five-point Likert-scale ranging from 0 'not at all like me' to 5 'extremely like me' (Gilbert et al., 2004). The scale was shown to be a valid and reliable measurement with high internal reliability for the subscale reassured self with Cronbach's alpha being .85 (Baião et. al., 2015).

2.5 Procedure

The participants of the University of Twente signed up for the research via SONA and students of the Saxion were asked by their teachers to participate as part of their minor. The students received a mail with further explanations and instructions about the study after

signing up for the app. Participants were further expected to complete a questionnaire that assesses, among other aspects that are not relevant for this research, the overall mental well-being as well as the self-compassion score of each participant. Completing the questionnaire took approximately 15 minutes. The participants were then asked to download TIP and complete the daily tasks within the app for a total of 18 days. Afterwards the students were asked to fill in the questionnaire that was already completed beforehand a second time and answer questions about their experience with the app. This enabled an evaluation of whether the mental health and self-compassion of participants had changed after using TIP.

2.6 Analysis

The obtained data from the students of the University of Twente and the Saxion was exported to SPSS version 26 and restructured into long format. In SPSS the dependent variables *well-being*, consisting of well-being at baseline and well-being postmeasure, as well as *self-compassion* consisting of self-compassion at baseline and self-compassion postmeasure, were created. Moreover, the independent variable *time* (1= before, 2= after) was used to indicate whether a score belonged to the pre- or post-questionnaire. All responses that did not fulfil the above-mentioned inclusion criteria were manually deleted. A linear mixed model analysis for each of the dependent variables was performed to assess whether the mean scores of the dependent variables *well-being* and *self-compassion* before and after using the app vary significantly. In other words, it was assessed if the main effect of *time* on *well-being* and *self-compassion* is significant.

Additionally, an interaction effect for *gender* was included in the linear mixed model analysis to evaluate whether the gender of the participant moderated the effect of *time* on the dependent variables. Furthermore, the filters *females only* and *males only* were created and used to investigate whether the variable *time* had a different effect on males and females. For

this aim, a linear mixed model analysis was run again separately for the two genders.

3. Results

In total 84 students filled in the pre-questionnaire and 54 students the post-questionnaire. The data of 17 students had to be excluded from the analysis. Participants that did not complete the questionnaire (n= 7), only completed the post-questionnaire or could not be matched with data of the pre-questionnaire (n=8), as well as participants that filled in the pre-questionnaire several times were excluded from the analysis (n=2).

3.1 Well-being

A mean score of 42.03 (*SD= 10.24*) was found for the well-being score of students before using the app and a mean score of 43.16 (*SD= 10.10)* for the well-being in the post-questionnaire (Table 1). Therefore, the well-being score increased slightly. Running a linear mixed model analysis with an interaction effect for gender showed that the effect of time on wellbeing is not significant (*B*= 1.13, *t*= .51, p>.05). Including the effect of gender as well as an interaction effect between gender and time revealed that there was no significant effect of the gender on the participants score (*B*= -3.55, *t*= -.95, p>.05) and of the gender in combination with time (*B*= 4.18, *t*= -.93, p>.05).

Conducting a linear mixed model analysis for *females* and *males* independently revealed no significant effect of time on well-being for *females* (*B*= 2.56, *t*= .98, p>.05) and no significant effect of time on well-being for *males* (*B*= -1.63, *t*= -.45, p>.05). Looking at the mean scores of men and women separately, it can be seen that the overall well-being score of *males* decreased from 47.23 (*SD*=8.46) to 45.6 (*SD*=11.27) whereas the mean score of *females* slightly increased from 39.49 (*SD*=10.15) to 42.05 (*SD*=9.59).

Table 1

Mean and Standard Deviation of the well-being of participants before and after using the app

	Before			After		
	N	*M*	*SD*	*N*	*M*	*SD*
Males	22	47.23	8.46	10	45.6	11.27
Females	45	39.49	10.15	22	42.05	9.59
Total	67	42.03	10.24	32	43.16	10.10

3.2 Self-compassion

The mean score of self-compassion in the pre-questionnaire was 21.45 (*SD= 5.88)* and for the post-questionnaire 22.03 (*SD= 5.15)* (Table 2). This shows that the self-compassion score overall increased. However, the increase is not significant (*B*= .54, *t*= .44, p>.05). Gender was shown to have no significant effect on the self-compassion score (*B*= -1.99, *t*=-.96, p>.05). Furthermore, the analysis did not indicate an interaction effect of gender and time on the self-compassion score (*B*= -2.28, *t*=-.91, p>.05).

A linear mixed model analysis for the effect of time on self-compassion of *females* showed a non-significant effect (*B*= 1.36, *t*= 1, p>.05). The mean scores displayed in table 2 show that the self-compassion score of females is slightly higher in the post-questionnaire but the mean score of males slightly lower than in the pre-questionnaire. The decrease of the self-compassion score in *males* is not significant (*B*= -.92, *t*= -.41, p>.05).

Table 2

Mean and Standard Deviation of the self-compassion of participants before and after using the app

	Before			After		
	N	*M*	*SD*	*N*	*M*	*SD*
Males	22	24.32	5.98	10	23.4	5.85
Females	43	20.05	5.34	22	21.41	4.81
Total	65	21.45	5.88	32	22.03	5.15

3.3 Evaluation

To evaluate whether certain problems and obstacles of the participants might have influenced the effectiveness of the app, answers to two open questions were analysed. To the question “What major problems with the operation with the app have you experienced?”, four participants indicated that the app stopped functioning several times or that it did not function properly, e.g.: “After part 5 the app crashed”. Additionally, other participants criticized the design of the app, which two students described as being “confusing” or “awkward” and stated that having access to an overview of what was filled in previously would be beneficial.

Moreover, the participants were asked to indicate what hindered them from completing all parts of the app in case they did not finish TIP in the 18 days. Six students stated that they simply forgot to use the app some days and five that they did not have enough time to finish the app which was also partly due to the fact that they occasionally forgot to use TIP. Two participants further reported a lack of motivation to use the app and others wrote that they did not have time (“it was a very busy week”) or energy on some days, e.g.: “I

missed some days because I forgot about the app and another few because life was a lot at times".

4. Discussion

4.1 Main findings

The aim of this pilot study was to assess the impact of the newly developed smartphone application TIP on the well-being and self-compassion of university students. It was hypothesised that using TIP for 18 days on a daily basis would positively influence the overall well-being as well as the self-compassion of participants. The hypothesis could not be confirmed as the scores for well-being and self-compassion increased slightly but not significantly. It is important to note that only the self-compassion and well-being scores of female participants increased slightly whereas the scores of males slightly decreased. This might either be due to the small number of males that filled in the post-questionnaire or suggests that the app is more effective for females. The results are not in line with the findings of the meta-analyses by Boiler, et al. (2013), Chakhssi, et al. (2018), and Hendriks, et al. (2020) who found a small but significant effect of positive psychology interventions on general well-being and mental health. Therefore, it might be the case that the kind of intervention and exercises included in previous studies are more effective which would explain the non-significant result in this study.

The results are further not in line with the described research that showed the positive effect of smartphone applications that are partly based on findings of positive psychology (Birney et al., 2016; Coelhoso et al., 2015; Parks et al., 2018; Roepke et al., 2015). In contrast to the apps examined in these studies, TIP is solely grounded on positive psychology which means that the results could not have been due to other psychological approaches, such as CBT. Therefore, it is possible that the positive effect found in the previously conducted

studies was due to aspects of the apps that are based on CBT and that positive psychology exercises in app form are not effective on their own. However, the discrepancies between this pilot study and previous research might have also been due to the limitations of this study and the problems students experienced with TIP.

4.2 Limitations

Several limitations limit the meaningfulness, representativeness, and reliability of the results. First of all, no control group was used in this study which means that it is unknown whether similar effects would have been observed without the app use. Not using a control group can negatively influence the internal validity of the study (Cranmer, 2017). Various confounding variables might have influenced the self-compassion and well-being of students such as the stress caused by exams which could have negatively affected the well-being of participants. Therefore, the results might be due to other factors than the app use as the study was not conducted in a controlled environment. Furthermore, the small sample size, as well as the high dropout rate, limit the representativeness of the study as well as the internal validity (Cranmer, 2017). Less than half of the students who originally signed up completed the post-questionnaire and indicated they used the app. This so-called participant mortality which results in an unequal sample size can negatively influence the results when, for example participants with especially high scores in the pre-questionnaire do not continue the study which artificially reduces the effect size (Cranmer, 2017). Additionally, especially the number of males who participated was very low with only ten males completing the post-questionnaire.

Another limitation is that it could not be ensured that participants used the app at all or on a daily basis for 18 days. However, this is also the case for the app use outside this research because individuals will most likely not use the app every day. On the other hand, in practice, individuals can use TIP over a longer period of time which can compensate for the

fact they do not use the app every day. Some students noted that they sometimes forgot to use the app, even though TIP offers daily reminders, or did not have time which might have negatively influenced the outcome of this study. It could be the case that the daily reminders were not functioning correctly or that the students that forgot to use TIP turned the reminders off.

Moreover, the full schedule of some students could have caused them to quickly finish an exercise without really thinking about it and not read the text and watch the video that belongs to the exercise. Some participants might have even filled in the post-questionnaire without using the app at all to receive SONA points. Another aspect that possibly influenced the results are the reported problems students had with the app which could have caused frustration and demotivation. Several participants indicated that the app would stop functioning at times and criticized the design of the app which did not include an overview of the already finished tasks. Therefore, the effectiveness of TIP might have been reduced due to the described problems and obstacles and could be the reason why the found effect on self-compassion and well-being was not significant.

4.3 Implications and further research

Due to the mentioned limitations, more research is needed to examine whether the application can significantly increase self-compassion and well-being. Before conducting future research on TIP, the app needs to be further improved in a way that it is functioning without problems, and it should be considered to add an overview that enables the user to see what is written in previous tasks. Additionally, it should be assessed if the reminders are working properly to ensure a lack of reminders is not the reason that participants forget to use the app.

In future research, a larger sample size, as well as a control group, should be used, and it needs to be ensured that participants are given sufficient time to complete the app.

Furthermore, this pilot study was solely carried out with university and university of applied sciences students and did not give any indications about the effectiveness of the app in a general population. As TIP was not specifically designed for students it would be important to conduct a study with a representative sample of the general population. It would further be interesting to investigate whether users of TIP can profit from the app on a long-term basis. Another aspect future research about TIP could focus on is comparing the effectiveness with other well-being apps which are not or only partly based on positive psychology.

5. Conclusion

To conclude, in this pilot study no significant increase in self-compassion and well-being was found which might have been due to the described limitations of the study. Even though no significant effect was found, no final conclusion that TIP does indeed not increase well-being and self-compassion can be drawn due to various limitations such as the small sample size and high dropout rate as well. Moreover, the circumstances such as stress caused by an exam might have negatively influenced the well-being and self-compassion of the students. The analysis revealed small increases in the scores of female participants which shows the potential of TIP to improve well-being and self-compassion in females. More research is needed to investigate whether the increase will be significant when using a more representative sample and considering the problems that appeared in this pilot study, such as the difficulties some students experienced with the app. Furthermore, more future research on smartphone applications that are solely based on findings of positive psychology is needed as most existing apps are based on CBT in addition to positive psychology.

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Appendices

Appendix A

Algemene Informatie

Kun je wel wat positiviteit en veerkracht gebruiken? Ben je gemotiveerd om zelfstandig jouw mentaal welbevinden te vergroten en ben je minimaal 18 jaar? Doe dan mee aan dit onderzoek van de Universiteit Twente!

Meedoen is vrijwillig. Voordat je de beslissing neemt, is het belangrijk om meer te weten over het onderzoek. Lees deze informatiebrief rustig door. Bespreek de inhoud met je vrienden, partner of familie. Heb je na het lezen van de informatie nog vragen? Dan kun je terecht bij de onderzoeker Kim Tönis. Onderaan deze brief vind je haar contactgegevens.

Doel van het onderzoek

De Universiteit Twente wil op basis van nieuwe wetenschappelijke inzichten de effectiviteit van een app met enkele positiviteitsoefeningen uittesten onder studenten. De app die in dit onderzoek onderzocht wordt is bedoeld om hen te ondersteunen in hun mentale weerbaarheid en positiviteit. Het doel van dit onderzoek is om vast te stellen of het gebruik van deze app kan helpen bij het vergroten van mentaal welbevinden en veerkracht.

Wie kunnen deelnemen aan het onderzoek?

Je kunt meedoen aan het onderzoek als je 18 jaar of ouder bent, in het bezit bent van een smartphone of tablet met een goede internetverbinding en beschikt over een e-mailadres. Het onderzoek is bedoeld voor mensen die (enigszins) last hebben van stressklachten of verminderd welzijn, mogelijk mede door de gevolgen van de coronacrisis. Je hebt behoefte aan ondersteuning bij het vergroten jouw mentale weerbaarheid en positiviteit. Je mag milde

psychische klachten ervaren, zoals somberheid, angst of slaapproblemen. Je mag geen ernstige psychische klachten hebben.

De app

Het is de bedoeling dat je een app downloadt op je smartphone of tablet. Met deze app doe je gedurende 3 weken 6 dagen per week een positieve psychologie-oefening gericht op het vergroten van jouw mentaal welbevinden. Ter ondersteuning ontvang je elke dag een herinnering van deze app.

Hoe werkt het onderzoek?

Aanmelding en toestemmingsverklaring

Wanneer je deze brief hebt gelezen en akkoord bent, dan onderteken je de toestemmingsverklaring online bij het invullen van de (eerste) vragenlijst.

Vragenlijstonderzoek en loting

In totaal duurt het onderzoek 1 maand. Voor het onderzoek vul je 2 keer een vragenlijst in. Als je mee kunt doen aan het onderzoek ontvang je de eerste vragenlijst bij de start van het onderzoek op een door jou opgegeven e-mailadres. De andere vragenlijsten ontvang je 3 á 4 weken na de start van het onderzoek na het afronden van de app. Deze vragenlijsten vul je online in, bijvoorbeeld thuis op jouw computer. Het invullen van de vragenlijst duurt per keer gemiddeld 20 minuten. Zodra je met de app aan de slag mag gaan, ontvangt je informatie over hoe je de app kunt downloaden en inloggen.

Vrijwilligheid deelname

Als je besluit niet mee te doen, hoef je verder niets te doen. Je hoeft ook niet te zeggen waarom je niet wilt meedoen. Als je wel meedoet, kun je je altijd bedenken en toch stoppen, ook als je daarvoor geen reden wilt opgeven. Dit kan ook tijdens het onderzoek.

Wat wordt er van jou verwacht?

Voor het onderzoek vragen wij je twee keer een vragenlijst in te vullen. Verder is het van belang dat je gemotiveerd bent om de app gedurende 3 weken te gebruiken en dat je in deze periode ongeveer 75 minuten per week met de oefening aan de slag gaat.

Voor- en nadelen van deelname aan dit onderzoek

Als je deelneemt aan het onderzoek levert je een belangrijke bijdrage aan de kennis over het effect van de app met positiviteitsoefeningen voor het welzijn en veerkracht van studenten in het hoger onderwijs. Voor de toekomst kan het onderzoek nuttige gegevens opleveren. Meedoen aan het onderzoek kan leiden tot een beter mentaal welzijn en veerkracht. Deelname aan het onderzoek heeft voor jou geen nadelen. Wel kost het je de tijd die nodig is voor het gebruik van de app en om de vragenlijsten in te vullen. De oefeningen van de app duren ongeveer 15 minuten per dag, 6 dagen per week (gedurende 3 weken). Het invullen van de vragenlijsten kost gemiddeld 20 minuten per keer (in totaal twee keer).

Privacy

Jouw persoonlijke gegevens, jouw antwoorden op de vragenlijsten zullen vertrouwelijk worden behandeld en gecodeerd worden opgeslagen. Dit betekent dat er een code wordt gegeven aan jouw gegevens, die niet naar jou herleidbaar is. Alle ingevulde vragenlijsten zullen los van jouw persoonlijke gegevens bewaard worden. Wij zijn verplicht jouw onderzoeksgegevens en persoonsgegevens 10 jaar te bewaren (dus los van elkaar). Daarvoor geeft je toestemming als je meedoet aan dit onderzoek. Gedurende de looptijd van het

onderzoek kunt je altijd contact opnemen met de onderzoeker wanneer je inzage in jouw gegevens wilt hebben.

Goedkeuring onderzoek

De Ethische Commissie van de faculteit BMS van de Universiteit Twente heeft haar goedkeuring verleend voor dit onderzoek. Dit betekent dat het onderzoek voldoet aan internationaal vastgestelde richtlijnen die nauwkeurig in acht worden genomen.

Verdere informatie

Mocht je nog vragen hebben dan kunt je altijd contact opnemen met Kim Tönis de uitvoerder van het onderzoek (zie hieronder voor haar contactgegevens). Wil je graag een onafhankelijk advise over meedoen aan dit onderzoek? Dan kunt je terecht bij een onafhankelijk deskundige. Hij is niet direct bij het onderzoek betrokken, maar wel voldoende op de hoogte om jouw vragen te kunnen beantwoorden. Zijn gegevens zijn: Prof. Dr. Gerben Westerhof, e-mail: [Contactgegevens]

Kim Tönis

Onderzoeker Universiteit Twente

[Contactgegevens]

Appendix B

Informed Consent

Door een vinkje te zetten voor elk van de volgende voorwaarden ga je akkoord met de voorwaarden voor deelname aan het onderzoek:

- Ik bevestig dat ik de informatiebrief voor deelnemers aan het onderzoek naar gebruik van de app met positiviteitsoefeningen heb gelezen en ik begrijp de informatie.
- Ik heb voldoende tijd gehad om over mijn deelname na te denken. Ik ben in de gelegenheid geweest om vragen te stellen. Deze vragen zijn naar tevredenheid beantwoord.
- Ik geef toestemming voor deelname aan dit onderzoek naar gebruik van de app met positiviteitsoefeningen.
- Ik weet dat mijn deelname geheel vrijwillig is en dat ik mijn toestemming op ieder moment kan intrekken zonder dat ik daarvoor een reden hoef op te geven.
- Ik stem in met het gebruik van mijn onderzoeksgegevens op de wijze zoals in de informatiebrief staat omschreven, onder het kopje “privacy”.