THE ROLE OF OPTIMISM FOR MENTAL WELL-BEING IN A POSITIVE PSYCHOLOGY INTERVENTION

10 EC Master thesis Positive Psychology and Technology

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Abstract

Introduction: In recent years, growing evidence suggests that increasing mental health proves to be an effective way of reducing symptoms of mental disorders such as anxiety and depression. This study investigates the role of optimism in mental well-being. A secondary analysis was conducted on a positive psychological self-help intervention to ascertain the relationship between optimism and mental well-being and to find out if optimism can be effectively improved by taking part in a positive psychological intervention.

Methods: A total of 275 participants were randomly assigned to either an experimental group (n=137) which received self-help book or to a wait-list control condition (n=138). They filled in online self-reporting questionnaires at baseline and after three and six months. Pearson correlation analysis was used to analyse the relation between optimism and mental well-being. A repeated measures ANOVA analysis was used to determine to what extent optimism had increased after the intervention.

Results: A significant positive correlation between optimism and mental well-being has been found at all times of measurement. This correlation was particularly strong three and six months after the start of the intervention. The repeated measures ANOVA analysis revealed a significant and time-stable increase in levels of optimism after the intervention for both the merged group and the experimental group.

Discussion: The findings of this study underline the importance of optimism for mental well-being. Furthermore, the results indicate that optimism could be well-suited as a component of future positive psychological interventions. Additional research is necessary to establish the effects of other similar concepts on mental well-being.

1. Introduction

According to the World Health Organization, health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO 2001). Clearly, This definition indicates that health and illness may coexist. This also applies to mental health. Research shows that mental well-being and mental illness are part of two separate dimensions and interrelate moderately (Huppert and Whittington, 2003; Keyes, 2005; Lamers et al., 2011; Weich et al., 2011). According to Keyes' (2007) classification framework of mental well-being, the two continua model, the classification of mental well-being stretches from languishing mental well-being to flourishing mental well-being. On the other hand, mental illness classification runs from no diagnosed mental disorder to a diagnosed mental disorder. Mental well-being is made of three essential pillars: emotional, psychological, and social well-being (Ryff and Keyes, 1995; Keyes, 2002; Westerhof and Keyes, 2010). Emotional well-being consists of being satisfied with one`s life and positive affect (Diener et al., 1999; Lamers et al., 2011). Psychological well-being refers to optimal psychological functioning and contains six different dimensions: positive relationships, self-acceptance, environmental mastery, autonomy, personal growth, and purpose in life (Ryff, 1989; Ryff and Keyes, 1995). Lastly, Social well-being concerns being a well-functioning member of the society and contains five dimensions: social contribution, integration, actualization, acceptance, and coherence (Keyes, 1998). People who possess high amounts of mental well-being are described as flourishers, whereas people with low levels of mental well-being are called languishers (Keyes, 2002, 2005).

While people who possess languishing mental health do not automatically suffer from a mental disorder (Keyes, 2002, 2005; Lamers et al., 2015), recent empirical evidence shows that higher levels of mental well-being and flourishing mental health prevent the occurrence of mental illnesses such as depression and anxiety (Grant et al., 2013; Keyes et al., 2010; Lamers et al., 2015; Schotanus-Dijkstra et al., 2016; Wood and Joseph, 2010). Conversely, people who do not suffer from mental illness can at the same time feel unhappy and be dysfunctional in their daily life (Keyes, 2007). What is more, evidence is mounting that individuals with flourishing mental health contribute most to the society and economy (Hamar et al., 2015; Keyes, 2007; Keyes and Grzywacz, 2005) whereas languishing mental health leads to an increase in health care costs and a loss of productivity (Keyes, 2005; Keyes and Simoes, 2012; Keyes et al., 2010; Keyes and Grzywacz, 2005). Research indicates that mental well-being is associated with having more meaningful relationships, requiring less

health care uptake and even being in a better state of physical health (Howell et. al 2007, Diener and Chan 2011, Lamers et al., 2012). It also reduces the mortality risk of people who are afflicted with a physical disease (Lamers et. al, 2012). On top of that, studies suggest that well-being decreases the chance suffering from mental symptoms and disorders (Keyes et. al, 2010, Wood and Joseph, 2010). Therefore, increasing mental well-being is imperative. According to one study, it has even be declared the number one goal of the public mental health agenda in Europe (Forsman et. al, 2015).

Positive psychological interventions (PPI) can help attain that goal, as they have shown promising results in increasing flourishing and mental well-being. A PPI is defined as a psychological intervention such as training, exercise or therapy, that focusses on increasing positive feelings, positive cognitions and positive behaviour rather than aiming to decrease symptoms, problems or disorders (Sin and Lyubormirsky, 2009). The number of evaluation studies demonstrating the efficacy of PPIs has increased considerably in the last decade. A meta-analysis conducted by Bolier et al. in 2013 showed that PPIs significantly enhanced subjective and psychological well-being and decrease depressive symptoms (Bolier et al., 2013). They also found that positive psychology self-help interventions can act as a cost-effective mental health promotion tool required to reach large target groups which would be out of reach otherwise. Many PPIs including interventions aimed at setting personal goals, counting your blessings, practicing kindness and using personal strengths have been shown to improve well-being and sometimes reduce symptoms of depression (Seligman et al., 2005). Especially interventions aimed at counting one`s blessings and using signature strengths proved to have a long-lasting positive effect on participants` happiness compared to a placebo control group (Seligman et al., 2005). The target group in these interventions was largely well-educated, white, financially comfortable, mildly depressed and motivated to become happier. Therefore, it is not clear whether these results can be applied to the general population.

With the increasing recognition of the importance of increasing mental well-being, positive expectancies for the future, usually described as hope and optimism in popular media and scientific research, have recently received an increasing amount of attention as potential mechanisms by which mental well-being may be improved (Gallagher and Lopez, 2009). Optimism has been shown before to be significantly positively related to life satisfaction (Rezaei and Khosroshahi, 2017). However, while optimism has been shown to yield positive results for well-being, most studies have explored how optimism is related to hedonic well-being (Gallagher, M. W., & Lopez, S. J., 2009). Hedonic well-being (more commonly known

as subjective well-being) is described as the frequent experience of pleasant emotions and moods, the infrequent experience of negative emotions and moods, and high levels of self-avowed life satisfaction (Diener, 1984). It does not encapsulate important aspects of psychological and social well-being, which are essential for flourishing well-being. To address this issue, the current study focuses on how optimism relates to flourishing well-being. Based on previous research indicating positive outcomes of optimism on hedonic well-being and life satisfaction, the first hypothesis is that optimism is significantly positively correlated to flourishing well-being. Optimism is the tendency to adopt the most optimistic view and signifies a cognitive and affective preparation and the belief that positive things in life are more significant than the negative ones (Scheier & Carver 1992). In addition, optimism implies a generalised expectation based on which an individual expects positive things will happen in important stages of their life (Cheuk-Yee 2008). Optimism not only provides an incentive to act, but also rewards behaviour that functions adaptively. From the viewpoint of learning theorists, optimism can be considered as an acquired thinking style. Seligman and colleagues (2006) stated that to an optimist, setbacks, failures, and adverse events are temporary, specific to a particular situation and due to external factors. Schwartz and Strack (1991) carried out a study on evaluating a judgemental model of happiness. Their findings indicated that optimists reply more positively and adaptively to events and circumstances; experience less stress; enjoy a stronger immune system and are more creative than unhappy individuals. What is more, a study by Weber et. al (2010) suggests that optimism is a teachable thought pattern. This is an interesting finding, because it indicates that people who don't possess an optimistic attitude can still be able to attain it. The current study therefore investigates whether participating in a positive psychology intervention relates to higher short and long term levels of optimism. As various PPIs have been shown to significantly improve subjective and psychological well-being and decrease depressive symptoms (Bolier et al., 2013), the second hypothesis is that participants experience a significant increase in optimism after following a positive psychological intervention that incorporated optimism. A multicomponent PPI which integrated the concept of optimism among others into the intervention is the self-help book "This is your life" which has been designed by Bohlmeijer and Hulsbergen in 2013. The results of this self-help program are promising and show that participants showed a higher increase in mental well-being compared to the wait list condition over a period of 9 weeks. Also, the proportion of flourishers increased in comparison to the waitlist group. More specifically, the proportion of flourishers increased from 7% to 34% in the intervention group

after 12 months. On top of that, participants showed a decline in depressive and anxiety symptoms (Schotanus-Dijkstra et al, 2017).

RQ1 Is optimism significantly positively correlated to flourishing mental health?
RQ2 Is there a significant increase in optimism after following the intervention *This is your life*?

2. Methods

This study conducted secondary analysis based on the dataset compiled by Schotanus-Dijkstra et al. in their 2017 study (Schotanus-Dijkstra et al., 2017).
The method section of this study will therefore in large parts refer to their study.

2.1 Design

The original study was designed as a parallel randomized control trial. Participants were distributed equally to either the Dutch self-help book *This is your life* with email support (TL-E) or a wait list control group (WL). Online questionnaires were completed at the beginning and after 3, 6, and 12 months.
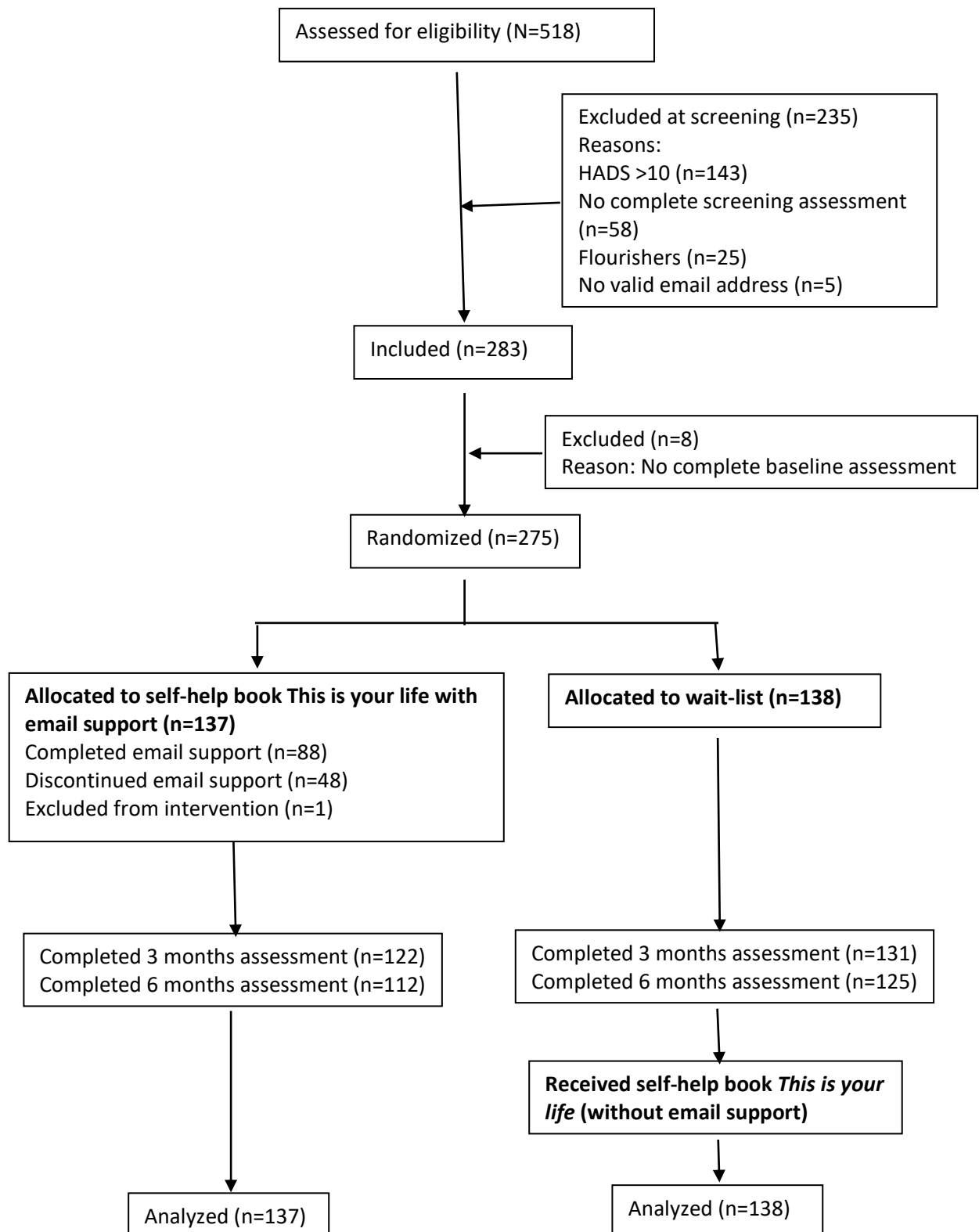
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                    Assessed for eligibility (N=518)


                                              Excluded at screening (n=235)
                                              Reasons:
                                              HADS >10 (n=143)
                                              No complete screening assessment
                                              (n=58)
                                              Flourishers (n=25)
                                              No valid email address (n=5)


                    Included (n=283)


                                              Excluded (n=8)
                                              Reason: No complete baseline assessment


                    Randomized (n=275)


  Allocated to self-help book This is your life with        Allocated to wait-list (n=138)
  email support (n=137)
  Completed email support (n=88)
  Discontinued email support (n=48)
  Excluded from intervention (n=1)


  Completed 3 months assessment (n=122)      Completed 3 months assessment (n=131)
  Completed 6 months assessment (n=112)      Completed 6 months assessment (n=125)


                                              Received self-help book This is your
                                              life (without email support)


  Analyzed (n=137)                            Analyzed (n=138)
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Fig. 1. Flowchart of participants in the *This is your life* study

2.2 Participants

Eligible participants were recruited via advertisements in newspapers and in an online psychology newsletter in the Netherlands, in January 2014. The participants were self-selected Dutch people with either low or moderate well-being who were at least 18 years of age and motivated to invest approximately 4 hours per week in the self-help intervention. Of 518 eligible participants in total, 275 completed the questionnaire at the start. 243 participants were excluded. The reasons for exclusions were a high HADS score, no complete screening assessment, being flourishing and giving no valid email address.

2.3 Procedure

After giving their informed consent online, participants received a screening questionnaire. Participants were excluded from the study if they had flourishing mental health as assessed with the Mental Health Continuum Short Form (MHC-SF, see Section 2.4 for more details; Keyes, 2006; Keyes et al., 2008) or (2) moderate or severe anxiety or depressive symptoms assessed with the Hospital Anxiety and Depression Scale (score > 10 on either the anxiety or depression subscale, HADS-A or HADS-D, respectively; Spinhoven et al., 1997; Zigmond and Snaith, 1983). Following the baseline measurement, the sample was randomized by using a random number generator in Microsoft Excel which stratified participants by their educational level (low, intermediate, high) and sex. After being randomly assigned to either the TL-E or WL group, the participants got an email with information and instructions concerning their respective group. The study took place between January 2014 and February 2015. In an effort to increase adherence, reminders were sent via email when questionnaires were incomplete.

2.4 Interventions

2.4.1 TL-E group (comprehensive positive self-help intervention)

The self-help book *This is your life* (Bohlmeijer and Hulsbergen, 2013) is a program based on the principles of positive psychology and is targeted for individuals with low or moderate mental health and no or minimal mental illness symptoms. It is aimed at improving several well-being components such as optimism, positive emotions and positive relations. It consists of 8 modules focusing on psychoeducation and positive psychology exercises aimed at improving the six most significant aspects of mental well-being: positive emotions, discovering and using strengths (two modules), optimism and hope, self-compassion, resilience, and positive relations (two modules; Schotanus-Dijkstra et al., 2015).

Participants were instructed to complete one module per week and had 8 to 12 weeks in total to finish the program. Furthermore, the participants received email support from Master students of positive psychology and technology in order to reduce participant dropout. To do this, the students were trained during a study course and in a workshop. In addition, they received weekly supervision. The email support was meant as way to support the participants and provide tailored personal feedback on the progression through the book. It was not meant for providing counselling.

2.4.2 WL control group

In the WL control group, participants received the book *This is your life* together with a 9 week time schedule after completing the 6 month follow-up questionnaire. In contrast to the TL-E group, participants were not supported via email.

2.5 Measures

Baseline characteristics have been measured for age, gender, education, nationality, marital status, living situation and employment status. The Life Orientation Test-Revised (LOT-R) was employed to measure the participants degree of optimism. The LOT-R consists of 3 optimism items, 3 pessimism items and 4 filler items (Scheier, Carver, & Bridges, 1994). The item scores range from 0 (strongly disagree) to 4 (strongly agree). The total score is computed by adding the optimism items and inversely coded pessimism items. This has been proven to be a more reliable measure in contrast to only using the 3 items of the optimism subscale. (Glaesmer et al., 2012). The reliability in the current sample was also good (α = 0.74). Higher scores indicate more optimistic expectations about the future. To assess anxiety and depressive symptoms, the HADS was used. Anxiety and depressive symptoms were assessed at screening and after 6 months for both the experimental and the control group. In the experimental group, it was also assessed after 12 months. Both the depression and the anxiety subscale in the HADS consist of 7 items which are scored from 1 to 3, with a maximum total score of 21 for each subscale. The higher the total score, the higher is the indicated level of depression or anxiety. The HADS is recognized as a valid instrument (Bjelland et al., 2002; Spinhoven et al., 1997) which proved to have solid internal consistency in the current sample (α = 0.76 in both subscales). To measure the participants well-being, the MHC-SF was used on all timepoints which are baseline, 3 months, 6 months and 12 months respectively. (Keyes et al., 2008). It consists of three subscales: 1. The emotional well-being

subscale (EWB) which consists of three items measuring happiness, positive affect and life satisfaction, 2. The subscale social well-being containing five items concerning social contribution, social integration, social actualization, social acceptance and social coherence, and 3. The subscale psychological well-being consisting of six items about self-acceptance, environmental mastery, positive relations, personal growth, autonomy and purpose in life. Every item was measured on a scale from 0 (never) to 5 (almost always). The MHC-SF achieved an α of 0.88 in the current sample. The emotional well-being subscale had an α of 0.80, the social well-being subscale had an α of 0.70 and the psychological well-being subscale had an α of 0.79.

In an effort to accurately measure flourishing mental health, criteria of the MHC-SF were used to classify as having either flourishing, moderate or languishing mental health (Keyes, 2006; Keyes et al. 2008). In order to be classified as a flourisher, participants needed to score 4 or 5 on at least one EWB item as well as six or more of the remaining eleven items. Participants who scored 0 or 1 on these items were considered languishers. Individuals who did not match either of the two requirements were classified as having moderate mental health. Because only 4,4% of the participants in the current sample were classified as languishing, the languishing and moderate mental health classifications were put together and coded as "not flourishing".

2.6 Statistical analyses

In the current study, the SPSS version 23.0 (IBM, Chicago, ILL., USA) and two-tailed tests with a significance level of 0.05 or less were employed to conduct the statistical analyses. Missing data were imputed (7.7%; Little's MCAR test: χ^2 (72) =55.91, p = 0.919) with the estimation maximization algorithm (EM). This is a method which uses observed data in an iterative process (Dempster et al., 1977) and has been demonstrated to be valid and reliable as compared to other imputation techniques (Blankers et al., 2010). Only the intention-to-treat results are reported due to a comparison to analyses with the observed data (i.e. completed questionnaires without imputation) revealing similar results. Descriptive statistics of participants characteristics were obtained. Differences in the baseline characteristics between the experimental and the control group were analysed using a chi square (χ^2) test. a bivariate correlation analysis was used to assess the correlation of optimism and flourishing mental well-being for the merged experimental and wait-list groups with well-being (MHC-SF) and optimism (LOT-R) as variables at baseline, after three months and after six months. The groups were merged according to the respective time of measuring. Cohen's (1988)

conventions are used to interpret the effect size of the correlation. A correlation coefficient of .10 is thought to represent a weak or small association; a correlation coefficient of .30 is considered a moderate correlation; and a correlation coefficient of .50 or larger is thought to represent a strong or large correlation. To measure whether optimism was increased after taking part in the intervention, a repeated measures test was used to investigate changes in optimism for the merged group, the experimental group and the waitlist group from baseline to three and six months. To interpret the effect size in the repeated measures analysis, Cohen's (1988) guidelines for effect size are referred to. They state that effect sizes from 0.01 to 0.059 are considered small, effect sizes from 0.06 to 0.14 count as medium, and effect sizes upwards of 0.14 are considered large.

3. Results

3.1 Demographics

Of the 275 participants, the overwhelming majority were female (85.8%). The participants age ranged from 20 years to 67 years with an average of 47.8 years. Almost all (90.9%) of the participants were Dutch, while the rest consisted of different nationalities. Nearly three quarters of the participants were highly educated (74.5%). 118 of the participants stated to be married, while 93 were single and 64 were separated or divorced. The majority of the participants were in paid employment (68.4%). The analysis of the χ^2 test showed no significant differences in the means of the baseline characteristics between experimental group and control group.

Table 1

Baseline characteristics of participants in the intervention group, control group and the total sample (n= 137).

	TL-E	WL	Total	χ2 sig.
Age, M (SD)	48.9 (10.9)	46.7 (10.8)	47.8 (10.9)	.554
Gender, n (%)				.882
Female	118 (86.1)	118 (85.5)	236 (85.8)	
Male	19 (13.9)	20 (14.5)	39 (14.2)	
Education, n (%)				.999
Low	5 (3.6)	5 (3.6)	10 (3.6)	
Intermediate	30 (21.9)	30 (21.7)	60 (21.8)	
High	102 (74.5)	103 (74.6)	205 (74.5)	
Marital status, n (%)				.496
Married	57 (41.6)	61 (44.2)	118 (42.9)	
Single	44 (32.1)	49 (35.5)	93 (33.8)	
Separated	36 (26.3)	28 (20.3)	64 (23.3)	
Nationality, n (%)				.286
Dutch	122 (89.1)	128 (92.8)	250 (90.9)	
Other	15 (10.9)	10 (7.2)	25 (9.1)	
Living situation, n (%)				.298
Alone	34 (24.8)	42 (30.4)	76 (27.6)	
With others	103 (75.2)	96 (69.6)	199 (72.4)	
Employment status, n (%)				.472
Paid employment	89 (65.0)	99 (71.7)	188 (68.4)	
Unemployed/ unable to work	33 (24.1)	26 (18.8)	59 (21.5)	
Other	15 (10.9)	13 (9.4)	28 (10.2)	

3.2 Correlation between optimism and flourishing mental well-being

Table 2 displays the correlation between flourishing and optimism at baseline, after three months and after six months for all 275 participants. The Pearson correlation at baseline was positive at 0.5, with a significance level of < 0.01. The Pearson correlation between optimism and flourishing after 3 months proved to be significantly positive again at 0.67 with a significance level of < 0.01. Lastly, the Pearson correlation between optimism and flourishing after 6 months proved to be significantly positive as well, indicating a correlation of 0.64 with a significance level of < 0.01. According to Cohen's (1988) guidelines, that indicates a strong significant positive correlation. This finding signifies that people who score higher on optimism will likely also possess higher levels of mental well-being.

Table 2

Correlation between flourishing and optimism (n=275)

Optimism				
		T0	T1	T3
Flourishing	T0	.500**		
	T1		.670**	
	T3			.644**

$**p < 0.01$

3.3 Change in optimism after the intervention

3.3.1 Results of the repeated measures ANOVA analysis

Table 3

Means and standard deviation of optimism in the experimental condition (N=137) and waitlist condition (N=138) at baseline (T0), after 3 months (T1) and after 6 months (T2)

	T0	T1	T2
Experimental	13.86 (3.47)	15.14 (3.41)	15.37 (3.77)
Waitlist	13.77 (3.43)	14.14 (3.24)	14.00 (3.57)

As seen in table 3, the repeated measures ANOVA analysis suggests that there is a significant effect of the independent variable time on the dependent variable optimism for the experimental group: $F(2, 135) = 16.46$, $p < .001$. The partial Eta squared score is .196. According to Cohen's (1988) guidelines for effect size, this effect of time on the level of optimism is considered large. However, this trend does not hold true for the waitlist group. No significant effect of time on optimism could be found [$F(2, 136) = 1.44$, $p = .240$] and the effect size was small at .021. The repeated measures ANOVA also showed a significant interaction effect between the variables time of measurement and intervention group: $F(2) = 8.25$, $p =<.001$. Summed up, these findings indicate that the intervention "This is your life" does seem to have a positive effect on optimism that remained stable up until six months.

3.3.2 Pairwise comparisons of optimism levels over time

The pairwise comparisons indicate for the experimental group a significant difference in optimism between T0 and T1 as well as T0 and T2, indicating that there is indeed a significant increase in optimism for the experimental group which occurs between baseline and the 3 months assessment. This means that the intervention appears to be very effective in both short- and medium term.

4. Discussion

4.1 Main findings

In the effort to increase the mental well-being of the population, positive psychological interventions seem like a promising tool. While optimism has shown to be of great value for increased hedonic (subjective) well-being and life satisfaction, further research is needed to shed light on to the relation between optimism and eudamonic well-being, also known as flourishing mental well-being (Gallagher, M. W., & Lopez, S. J., 2009). In addition, literature is still lacking on whether optimism can be effectively increased by positive psychological interventions. To help address these issues, the current study had two goals: First, to ascertain the relation between optimism and flourishing by conducting secondary analysis based on a randomized control trial study of an early self-help positive psychology intervention to promote well-being and flourishing by Schotanus-Dijkstra et al. (Schotanus-Dijkstra et al., 2017). Second, to analyse whether the levels of optimism improved after taking part in the intervention.

The results of the current study indicate that optimism is positively related to flourishing and that optimism is improved by the self-help intervention *This is your life*. A strong significant positive correlation has been found between optimism and flourishing, indicating that people with high levels of optimism are more likely to have flourishing mental well-being. These findings are in line with the research by Schwartz and Strack (1991), who found that optimists reply more positively and adaptively to events and circumstances; experience less stress; enjoy a stronger immune system and are more creative than unhappy individuals, all of which are factors pertaining to mental well-being. Furthermore, the results of the current study revealed that the correlation between optimism and flourishing increased up to three months after the start of the intervention and then stayed stable up until six months later. This finding suggests that the significant positive relationship between optimism and flourishing mental well-being is a phenomenon that is stable over time and can be strengthened further by a positive psychology intervention.

What is more, the present study that participants of the positive psychology intervention "This is your life" experienced a large increase in optimism. The levels optimism increased namely in the first three months after the beginning of the intervention. In addition, the levels of optimism stayed stable up until six months after the start of the intervention. These findings indicate a positive long-time effect of the intervention on optimism. Compared to the control group, the average level optimism rose significantly in the experimental group. This finding is in line with the results of a study by Huang et al (2016), where participants showed significant improvements in optimism compared to a control group after taking part in a positive psychology intervention for cancer patients (Huang, Li et

al. 2016). The reasons for this could be diverse: There are many exercises in the self-help book "This is your life" that can increase optimism, for example the "three good things" exercise, which aims to emphasise the positive events of each day. What is more, the self-help book also outlines the theory behind the exercises which could increase participants' motivation to follow through on them. Also, participants in the experimental group received email support during the intervention which may have increased their confidence in the intervention, thus also influencing their optimism positively. This would be in line with the findings of a study by Andersson and Cuijpers (2009), who found that effect sizes of web-based treatments for depression grew from small to medium when personal support was added to the treatment. All in all, these findings underlines the important role of the intervention *This is your life* in increasing optimism. It is also coherent with the results of a meta-analysis conducted by Bolier et al. in 2013, stating that positive psychological interventions can increase mental well-being, of which optimism is a part. The findings of this study are novel because it demonstrates that optimism can be increased by taking part in a positive psychology intervention. While positive psychology interventions have been proven to increase mental well-being and decrease symptoms of depression and anxiety (Bolier et al. 2013), literature concerning optimism as part of a positive psychological intervention is still rare. While some studies have been conducted to estimate the effect of positive psychological interventions on optimism, they mostly focused on exotic target groups like breast cancer patients (Huang, Li et al.) or Brazilian retirees (Durgante and Dell'Aglio, 2019). The sample of this study, while not perfect, is much more applicable to the general Western European population.

4.2 Strengths and limitations of the study

One of the strengths of this study is that it investigated something which has not yet received much attention in literature: The relation between optimism and flourishing mental well-being and to what extent optimism is increased by a positive psychological intervention. Furthermore, the current study analysed changes in optimism over a period of up to six months after the start the intervention, allowing to draw conclusions over the long-term effect of a positive psychological intervention on optimism. Also, the correlation of optimism and flourishing mental well-being has been studied over six months, making the results more viable.

A limitation of the study is that the participants were mostly higher educated women, decreasing the representability for the whole Dutch population. Unfortunately, this is the case

in many similar studies in the field, highlighting the difficulty of attaining a sample that contains both men and women of diverse age and education. To address this issue, future studies could give out small rewards for participating that are appealing to a diverse population, especially lower educated males. Another issue with the current study is that the scope was quite limited in that it exclusively focused on optimism and only incorporated correlational research.

4.3 Implications for practice and future research

The results of this study indicate that optimism is a trait that contributes to flourishing and could therefore be the focus of future positive psychological interventions. Furthermore, the results showed that optimism can by participating in a positive psychological intervention. This finding is in line with a study by Weber et. al (2010), which indicates that optimism is a teachable thought pattern. This has relevant implications for the development of new positive psychological interventions, because it makes optimism ideally suited as part of it. However, further research is needed which exact positive psychology exercises are most effective in increasing optimism. Furthermore, while this study found a significant positive correlation between optimism and flourishing mental well-being, the causal relationship has not been analysed. This could be an interesting approach for future research. While the causal effect of optimism on psychological and physical well-being has been shown in literature (Scheier and Carver, 1992), the causal effect of optimism on flourishing mental well-being has yet to be investigated. The current study also illustrated the value of positive psychological self-help interventions in general, providing a great reach to otherwise unobtainable target groups especially in rural areas. This is significant because increasing mental well-being is a priority health care goal in Europe and the USA, where low and moderate mental well-being is highly prevalent (Huppert and So, 2013; Keyes, 2005, 2007).

Further research is needed on how other emotions and traits influence mental well-being and how they can be improved. Another interesting concept in this context similar to optimism would for example be hope. While optimism refers to more generalized expectations (e.g., I will achieve my goal) and focuses less on how or why the goal is reached (Carver & Scheier, 2002), hope theory places a greater emphasis on the presence of personal agency related to goals (the 'will') and the identification of strategies to achieve those goals

(Rand & Cheavens, 2009; Snyder, 2002; Snyder et al., 1991). Hope theory therefore suggests that in addition to endorsing such statements as 'I will achieve my goal,' a high hope individual would endorse statements similar to 'I have a plan for how I am going to achieve this goal' and 'I am motivated and confident in my ability to use this plan to achieve this goal.' While hope has been shown to be positively related to mental well-being (Gallagher and Lopez, 2009), literature on whether it, like optimism, could also be improved by positive psychological intervention is still lacking and could be an interesting prospect for future research.

To conclude, this study found that optimism is significantly positively related to increasing flourishing mental well-being and can be implemented successfully into self-help positive psychological interventions. In turn, this means that self-help interventions containing exercises to increase optimism are a promising way to strengthen the well-being of the population. The insights of this study can help improve future positive psychological interventions by highlighting the value of optimism in increasing flourishing mental well-being.

References

Andersson, G., Cuijpers, P., 2009. Internet-based and other computerized psychological treatments for adult depression: a meta-analysis. Cogn. Behav. Ther. 38, 196–205.

Bjelland, I., Dahl, A.A., Haug, T.T., Neckelmann, D., 2002. The validity of the Hospital Anxiety and Depression Scale: an updated literature review. J. Psychosom. Res. 52, 69–77.

Blankers, M., Koeter, M.W., Schippers, G.M., 2010. Missing data approaches in eHealth research: simulation study and a tutorial for nonmathematically inclined researchers. J. Med. Internet Res. 12, e54.

Bohlmeijer, E., Hulsbergen, M., 2013. Dit is jouw leven. Ervaar de effecten van de positieve psychologie (This is Your Life. Experience the Effects of Positive Psychology). Uitgeverij Boom, Amsterdam, The Netherlands.

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: a meta-analysis of randomized controlled studies. BMC public health, 13(1), 119.

Carver, CS and Scheier, MF. 2002b. The hopeful optimist. Psychological Inquiry, 13: 288–290

Cheuk-Yee, T., 2008. Daily Hassles and Health: The Protective Role of Optimism among Chinese Adults in Hong Kong (M.H. thesis, City Shaw University of Hong Kong)

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Hillsdale, NJ: Erlbaum.

Dempster, A. P., Laird, N. M., & Rubin, D. B. (1977). Maximum likelihood from incomplete data via the EM algorithm. Journal of the Royal Statistical Society: Series B (Methodological), 39(1), 1-22.

Durgante, H., Dell'Aglio, D. D., 2019. Multicomponent positive psychology intervention for health promotion of Brazilian retirees: a quasi-experimental study. Psicologia: Reflexão e Crítica, *32*(1), 6.

Forsman, A.K., Wahlbeck, K., Aaro, L.E., Alonso, J., Barry, M.M., Brunn, M., Cardoso, G., Cattan, M., de Girolamo, G., Eberhard-Gran, M., Evans-Lacko, S., Fiorillo, A., Hansson, L., Haro, J.M., Hazo, J.B., Hegerl, U., Katschnig, H., Knappe, S., Luciano, M., Miret, M., Nordentoft, M., Obradors-Tarrago, C., Pilgrim, D., Ruud, T., Salize, H.J., Stewart-Brown, S.L., Tomasson, K., van der Feltz-Cornelis, C.M., Ventus, D.B., Vuori, J., Varnik, A., 2015. Research priorities for public mental health in Europe: recommendations of the ROAMER project. Eur. J. Pub. Health 25, 249–254.

Gallagher, M. W., & Lopez, S. J. (2009). Positive expectancies and mental health: Identifying the unique contributions of hope and optimism. The Journal of Positive Psychology, 4(6), 548-556.

Glaesmer, H., Rief, W., Martin, A., Mewes, R., Brähler, E., Zenger, M., & Hinz, A. (2012). Psychometric properties and population-based norms of the Life Orientation Test Revised (LOT-R). British journal of health psychology, 17(2), 432-445.

Grant, F., Guille, C., Sen, S., 2013. Well-being and the risk of depression under stress. PLoS One 8, e67395.

Hamar, B., Coberley, C., Pope, J.E., Rula, E.Y., 2015. Well-being improvement in a midsize employer: changes in well-being, productivity, health risk, and perceived employer support after implementation of a well-being improvement strategy. J. Occup. Environ. Med. 57, 367–373.

Huang, X.-F., Li, F., Mao, J.-T., Chen, S.-X., Ji, J.-S., Zhou, X.-H., 2016. Effect of positive psychological intervention on the posttraumatic growth and optimism tendency in patients with liver cancer after receiving interventional therapy. Journal of Interventional Radiology (China) 25(5), pp. 449-452

Huppert, F.A., Whittington, J.E., 2003. Evidence for the independence of positive and negative well-being: implications for quality of life assessment. Br. J. Health Psychol. 8, 107–122.

Keyes, C.L., 2002. The mental health continuum: From languishing to flourishing in life. J. Health Soc. Behav. 43, 207–222.

Keyes, C.L., 2005. Mental illness and/or mental health? Investigating axioms of the complete state model of health. J. Consult. Clin. Psychol. 73, 539–548.

Keyes, C.L., 2007. Promoting and protecting mental health as flourishing: a complementary strategy for improving national mental health. Am. Psychol. 62,

95–108

Keyes, C.L.M., Dhingra, S.S., Simoes, E.J., 2010. Change in level of positive mental health as a predictor of future risk of mental illness. Am. J. Public Health 100, 2366–2371.

Lamers, S.M.A., Westerhof, G.J., Bohlmeijer, E.T., ten Klooster, P.M., Keyes, C.L.M., 2011. Evaluating the psychometric properties of the Mental Health Continuum-Short Form (MHC-SF). J. Clin. Psychol. 67, 99–110.

Lamers, S.M.A., Westerhof, G.J., Glas, C.A.W., Bohlmeijer, E.T., 2015. The bidirectional relation between positive mental health and psychopathology in a longitudinal representative panel study. J. Posit. Psychol. 10, 553–560.

Rand, K.L., & Cheavens, J.S. (2009). Hope theory. In C.R. Snyder & S.J. Lopez (Eds.), Handbook of positive psychology (2nd ed., pp. 323–333). New York: Oxford University Press.

Rezaei, A., & Bahadori Khosroshahi, J. (2018). Optimism, Social Intelligence and Positive Affect as Predictors of University Students' Life Satisfaction. European Journal of Mental Health, 13(2), 150-162.

SCHEIER, M.F. & C.S. CARVER (1992) Effects of Optimism on Psychological and Physical Well -being: Theoretical Pverview and Empirical Update', Journal Cognitive Therapy and Research 16, 201–28 (http://dx.doi.org/10.1007/BF01173489).

Schotanus-Dijkstra, M., Drossaert, C.H.C., Pieterse, M.E., Walburg, J.A., Bohlmeijer, E.T., 2015. Efficacy of a multicomponent positive psychology self-help intervention: study protocol of a randomized controlled trial. J. Med. Internet Res. Res. Protoc. 4, e105.

Schotanus-Dijkstra, M., ten Have, M., Lamers, S.M.A., de Graaf, R., Bohlmeijer, E.T., 2016. The longitudinal relationship between flourishing mental health and incident mood, anxiety and substance use disorders. Eur. J. Pub. Health [Epub ahead of print].

Schotanus-Dijkstra, M., Drossaert, C. H., Pieterse, M. E., Boon, B., Walburg, J. A., & Bohlmeijer, E. T. (2017). An early intervention to promote well-being and flourishing and reduce anxiety and depression: A randomized controlled trial. Internet Interventions, 9, 15-24.

Schwartz, N. & F. Strack (1991) 'Evaluating One's Life: A Judgment Model of Subjective Well- Being' in F. Strack, M. Argyle & N. Schwarz, eds., Subjective Well-Being: An Interdisciplinary Perspective (Elmsford, NY: Pergamon) 27–47.

Seligman, M. E., Steen, T. A., Park, N., & Peterson, C. (2005). Positive psychology progress: empirical validation of interventions. American psychologist, 60(5), 410.

Seligman, M.E.P., T. Rashid & A.C. Parks (2006) 'Positive Psychotherapy', American Psychologist 61, 774–88 (http://dx.doi.org/10.1037/0003-066X.61.8.774).

Snyder, CR. 2002. Hope theory: Rainbows in the mind. Psychological Inquiry, 13: 249–27

Snyder, CR, Harris, C, Anderson, JR, Holleran, SA, Irving, LMSigmon, ST. 1991. The will and the ways: Development and validation of an individual-differences measure of hope. Journal of Personality and Social Psychology, 60: 570–585.

Spinhoven, P., Ormel, J., Sloekers, P.P., Kempen, G.I., Speckens, A.E., Van Hemert, A.M., 1997. A validation study of the Hospital Anxiety and Depression Scale (HADS) in different groups of Dutch subjects. Psychol. Med. 27, 363–370.

Weber, S., K.R. Puskar& D. Ren (2010) 'Relationships between Depressive Symptoms and Perceived Social Support, Self-Esteem, and Optimism in a Sample of Rural Adolescents', Issues in Mental Health Nursing 31, 584–88 (http://dx.doi.org/10.3109/01612841003775061).

Weich, S., Brugha, T., King, M., McManus, S., Bebbington, P., Jenkins, R., Cooper, C., McBride, O., Stewart-Brown, S., 2011. Mental well-being and mental illness: findings from the Adult Psychiatric Morbidity Survey for England 2007. Br. J. Psychiatry 199, 23–28.

Wood, A.M., Joseph, S., 2010. The absence of positive psychological (eudemonic) wellbeing as a risk factor for depression: a ten year cohort study. J. Affect. Disord. 122, 213–217.

WHO. (2001). Strengthening mental health promotion. Fact sheet. Geneva: World Health Organization.

Zigmond, A.S., Snaith, R.P., 1983. The hospital anxiety and depression scale. Acta Psychiatr. Scand. 67, 361–370.